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Publishers' Announcement

The growth of THE MUNICIPAL JOURNAL AND ENGINEER necessitates a larger staff and more commodious quarters. On May 1, or a few days thereafter, the offices will be transferred from the ninth to the fifth floor of the Flatiron Building.

Files of the paper, current issues of all other publications of interest and a library of information upon municipal matters will always be available to those interested.

Mr. G. E. Sly, formerly with *Power;* Mr. M. C. Robbins, formerly with *Engineering News,* and Mr. F. P. Burt, of the *American Architect,* have acquired an interest and become directors.

Mr. Sly is advertising manager and Mr. Robbins is Western manager, with offices on the eighth floor of the Monadnock Block, Chicago.

The ownership is now vested in the Swetland Publishing Co., of which H. M. Swetland is President, G. E. Sly and M. C. Robbins Vice Presidents, F. P. Burt Secretary and J. T. Morris Treasurer.

Useless Use of Catch Basins

This is a subject which has been referred to before in these columns, and in all probability it will be again; for a practice confirmed by tradition is difficult to upset, even when changed conditions remove its reason for existence. The annual statistics of the city of Chicago for 1906, just received, offer such excellent substantiation of our contention that we seize the opportunity to reiterate it. The number of catch basins in that city at the beginning of the year was 61,502, and at the end 64,016, an average of 62,759. The total number of cleanings during the year was 19,226. If all the catch basins in the city were cleaned in rotation, this would mean a cleaning of each once every thirty-nine months; or if those requiring it are cleaned as often as they fill, then, since they will fill at least every three months if at all, only one-thirteenth of the catch basins are of any service in intercepting street dirt. Of the 1,653 miles of sewers in the city, 475.6 miles were cleaned during the year, which would seem to indicate that the department was not delinquent in the matter of maintenance, especially as a nearly equal length was cleaned in 1905, which would indicate that this was not in the nature of emergency work, but was their regular practice. When streets are unpaved and of such a character that heavy matter is washed into the inlets, then catch basins are desirable. But they are almost never of any service on paved streets, and are an unnecessary expense to construct and to maintain.

Real Estate of Three Dimensions

NOT many centuries ago, when real estate was acquired by a noble (no one else had the privilege) the fee simple included the lives of all those dwelling thereon; it was a revolution—a slow one in some cases, the French variety in others—which removed this right from the owners. The rights in the real property which still remained, however, included the privilege of perfect freedom of action upon this property and also possession downward to the center of the earth and upward to the stars.

During the past century the rights of the people at large in even private real estate have become recognized more and more, and there is now little disputing of the idea that even on private property an owner cannot do that which will be a nuisance to his neighbors or the public at large. We have even begun to feel that in other ways the absolute ownership of property must be restricted for the public good. Is it not about time that the height and depth of such ownership should be subjected to legal limitations? In most cities of this country an owner is limited in the

height of building which he can place upon his property only by the laws of nature and the ingenuity of engineers. Five years ago it was stated by many that the limit to which buildings could be erected had been reached in the city of New York, but already plans are being prepared for structures higher than any then contemplated. If a single building on a 50x100-foot lot can be erected to 18 or 20 stories and still be given sufficient rigidity, who can affirm that a building covering an entire block may not be erected to two or three times this height, providing a sufficiently solid foundation can be found, such as exists in the bed-rock of middle and upper Manhattan; or even in the lower part of the island by going to sufficient depth? The narrow streets of the old city were ample to accommodate all traffic attracted there by the relatively small number of residents and business houses. At the present time the lofty office buildings have converted these narrow streets into canyons in which, during morning, noon and evening rush hours, hurrying humanity swarms in crowds. If the limit to the capacity of buildings in that area has not been reached, the capacity of the streets has certainly been very nearly so, and it would seem imperative that some measures be taken to prevent any further crowding therein. Unless the barbarous and unchivalric instinct aroused and cultivated by the daily Brooklyn Bridg crush is to be fostered by similar conditions in the business districts, some plan must be found for either restricting the number of users of New York's canyons or else for increasing the capacity of these as thoroughfares. It has already been suggested for short lengths of similar streets that these be given double decks, and in Chicago, for instance, actual use has been made of underground tunnels for freight carrying, while the three tiers of transit lines are familiar to New Yorkers. It is at least worth considering whether the time has not arrived for restricting the relative heights of buildings and widths of streets. For instance, the permissible height of a building might be limited to four times the distance from the front of the same to the middle of the street; the owner could then make his own calculations as to relative economy to him of erecting the high building a certain distance back from the building line, or a low one flush therewith. Three-hundred-foot office buildings on forty-foot streets would create conditions intolerable from the standpoint of health, street accommodation or fire risk.

Sewerage Assessments

The method of assessing the cost of sewer construction in the town of West Hartford, Conn., was described by Mr. Algernon B. Alderson in a paper before the Connecticut Society of Engineers, which is briefly abstracted below.

The special laws of Connecticut authorize the Sewer Commissioners of a town "to apportion and assess the expense . . . . upon the land and buildings in said town which shall, in their judgment, be especially benefited thereby, whether they abut on the sewers or not, and upon the owners of such land, subject to the right of appeal as hereinafter provided." In this particular case the sewage was discharged into an outlet of the Hartford sewer system, for which the sum of $8,440 was paid to the city of Hartford. This, together with the entire cost of sewering the town, was assessed against the property and none was taken from the town treasury. The assessment was divided into four items, the first, being the sum paid the city of Hartford, was levied on the total assessable area in the district, and distributed equally among all property holders according to their precise area, the rate being $96.-7744. The second item represents the cost of the trunk sewer, engineering, legal expenses and interest on notes, trunk sewers being defined as all sewers over and above 8 inches in diameter, except one sewer built by the city of Hartford, for which the minimum was taken as 10 inches. This item was levied on the total area as was Item 1. Item 3 was for local sewers, being the cost of an 8-inch pipe and appurtenances equal in length to the total length of the system built by the town, plus the cost of a 10-inch pipe equal to the length of the Hartford sewer above referred to, this being the cost of a sewer in front of each individual property if a larger size were not required for carrying the sewage brought from the further sections of the system. This item was applied directly to all property in proportion to its front footage, where a sewer had been actually constructed. The charge per front foot for this item was 54.833 cents. Item 4 was for house connections, consisting of the cost of a 6-inch connection pipe laid to the curb line, at the rate of 50 cents per foot, this being charged directly to the property served. Item 2 amounted to $6,486.55, Item 3 to $6,644. The writer stated that it would be more logical to assess Items 1 and 2 at a given rate per house-lot, but that the undeveloped condition of a large portion of the district (which should nevertheless pay its share of the items chargeable to the system as a whole) precluded the possibility of such form of assessment. There was no injustice, he thinks, in making this assessment upon all property irrespective of location, because it is all directly served by rapid transit, and may be developed for building purposes within a reasonably short time. As an illustration of the relative size of the various items, a certain building lot 50x150 was assessed as follows:

Item 1.	Outlet	$16.64
Item 2.	Trunk rights	12.79
Item 3.	8-inch local sewer	27.42
Item 4.	H. C., 6-inch pipe	7.00
Total		$63.85

Or $1.277 per front foot.

Stone for Macadam Roads

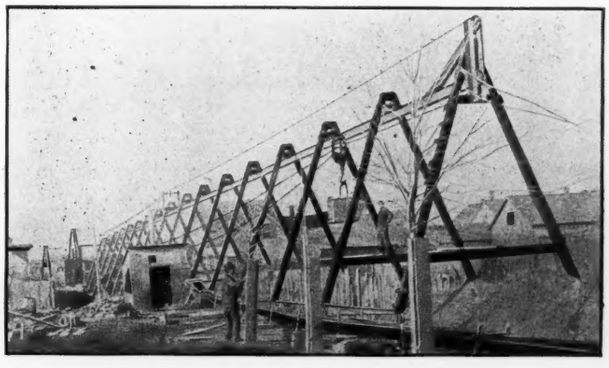
In the article under this title in our April 17th number two unfortunate typographical errors escaped detection until a correspondent called our attention to them. The factor given as 273.44 should have been 27.344; and that given as $5,86 2-3 should have been $586 2-3.

SEWERAGE CONSTRUCTION WORK

Use of Machinery in Excavating Trenches—Trestle Conveyors—Cable Conveyors—Chain Excavators—Wheel Excavators—Making Sewer Joints in Wet Trenches

In the excavating of sewer trenches hand work has been and is still the more common practice, but the use of machinery of various kinds is being adopted more and more as the difficulties connected with its use are overcome, and as its convenience and economy become appreciated. Such machinery may be roughly divided into three different classes: One which merely elevates the dirt in tubs or buckets from the bottom of the trench where these have been filled by hand labor; such contrivances are generally in the form of derricks of ordinary or special design. The second class not only elevates the buckets, but carries them lengthwise of the trench and empties them upon the completed sewer, and might be called transporting machinery. The third class are true excavators, and perform the digging as well as the elevating of the earth, after the general principle of a steam shovel. The first of these is ordinarily applicable only to wide and deep trenches, because of the expense and delay of shifting the position of the derrick as soon as the trench within reach of its boom has been excavated. In certain cases the derrick has been mounted upon a car which travels alongside of the trench, but this plan has not ordinarily been found efficient or economical.

The second class is that which has found the widest use and a considerable number of different styles have been designed and patented. The first to be used extensively in this country was designed by Mr. H. A. Carson for use in the construction of sewers in Boston, of which work he at that time had charge. There are several variations of this general class designed, some for light work and some for heavy work, some for narrow trenches and others for wide, but in general they all consist of a series of trestles of either rectangular or A shape, which span the trench and travel upon two rails, one on each side of it. From the top of the trestle is suspended a track, from which hang carriers holding the buckets and so arranged with an ordinary use of sheave and double rope as to permit of stopping the buckets at any point over the trench and lowering them into the same. In operation, after lowering the empty buckets, the hook is fastened to the full ones, which are then raised to the track and transported through the openings in the trestles to the completed trench, where their contents are emptied to form backfilling. Other machines have been designed whose purpose is the same, but in which a track is placed upon the top of the trestle and a framed traveler runs back and forth upon this track, into which traveler the full buckets are raised, and the traveler carrying the bucket is drawn to the completed trench, where the bucket is then dumped by an operative who remains constantly in the traveler. This construction was first used for handling larger buckets than was possible with the original Carson machine, but the later machines of that type have been designed to carry buckets holding a cubic yard, and the use of the heavy traveler with the unnecessary waste of energy in moving it and other inconveniences has not made much progress. In each of the trestle constructions, the series of trestles, connected together into a train, run upon a track as already stated, and are from time to time drawn ahead as the trench work progresses, without in any way changing the structure as a whole. Still another variation of this type consists of an ordinary cable-way stretched longitudinally above the center of the trench, supported by a simple trestle at each end, the cable being anchored at each end by means of "dead men," planted in the ground beyond each trestle, or else weighted down by stone or brick. This cable-way carries the travelers from which the buckets are suspended and lowered, which are thus transported longitudinally of the trench. This last contrivance has, as its special advantage, the absence of any structure immediately over or along the trench which would be in the way when placing the sheeting or handling the materials of construction, pumping, etc., all of which are more or less interfered with by the trestle form of machinery; it also is adapted to crossing railroad tracks, intersecting streets or any

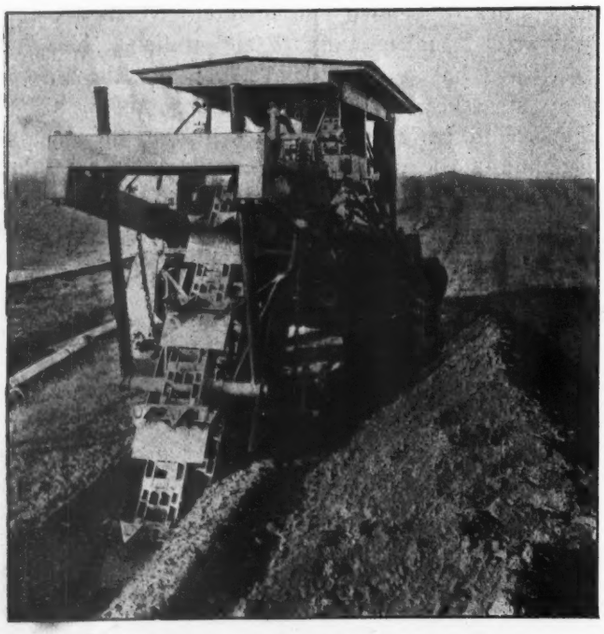


CARSON-TRAINOR CONVEYOR, AT FT. WAYNE, IND.

CARSON-LIDGERWOOD CABLEWAY, WALWORTH RUN SEWER, CLEVELAND

other localities where it is not permitted to block the street with trestles. Its chief disadvantage is the expense and delay incurred in changing the anchorages and the end trestles which support the cable, which work, however, may ordinarily be done at night, and thus avoid interference with the sewer construction. Another objection is the possibility of a "dead-man" pulling out and allowing the bucket and cable to drop into the trench, which accident the writer himself has seen occur.

Of the third type of machine, the true excavator, there are two general styles, one in which a number of buckets, cutters, etc., are placed upon an endless chain carried by an adjustable boom, the motion being imparted to the chain and its buckets through sprocket wheels driven by steam or gasoline machinery. The other style consists of a wheel with the buckets fastened upon its circumference, the whole wheel being not only revolved by means of teeth on its inner circumference, but also lowered into the earth as the depth of the trench increases. In each of these the earth brought up by the buckets is delivered upon a traveling belt or into a shute which discharges it at one side of the machine, where it either collects in a pile along the trench, or is received by carts which move successively into position. The Chicago Sewer Excavator is an illustration of the first type. It is claimed that these machines will excavate trenches to as much as 20 feet depth. They are made to dig trenches of widths varying from 14 to 60 inches, the same machine digging several widths, which are determined by the size of bucket used. The machine, including the boom, buckets, etc., is self-propelling and backs along the trench, the wheels resting upon ground which has not yet been excavated. The smaller sizes are operated by an engineer and a fireman, but where the depth is greater than 13 feet a third operator is required. These machines are not sold, but are leased by the company to contractors, the regular terms being 5 cents per cubic yard royalty for trenches less than 8 feet deep, and 10 cents for all deeper ones, with minimum charges of $20 to $35 per day, depending upon the size of the machine. The manufacturers claim that from one-half to one and one-half tons of coal per day of ten hours will run the different sizes of machines; also that they will work in any kind of soil except quicksand or where there are many boulders, large roots, water or gas pipes, or other obstructions, although boulders the size of a peck measure can be handled by it. The most favorable location for machine work, as indeed for hand work, is a loamy or clay soil which will stand without sheeting, although a trench which will stand for an hour or so after excavation by machine can of course be sheeted. Some of the early machines which the writer saw were apparently made too light and were subject to occasional accidents from bent or broken parts; but it is believed that this objection has been overcome in the machines now turned out.



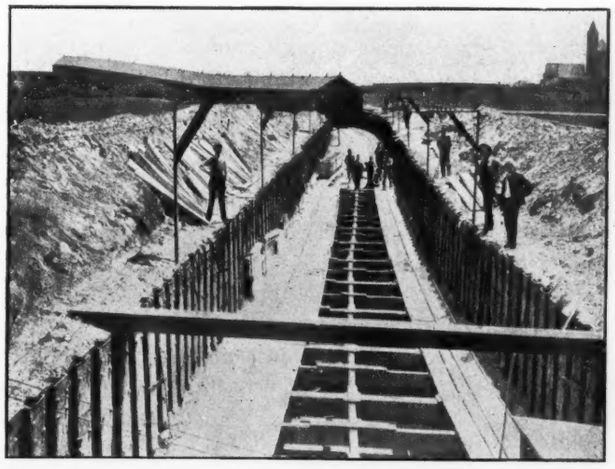
CHICAGO TRENCH EXCAVATOR. SMALL SIZE

The wheel type of excavator is manufactured by the Buckeye Traction Ditcher Company, and consists of a large wheel to the circumference of which are fastened digging buckets somewhat similar to the buckets of a steam shovel. This wheel has no axle, but is supported by four pairs of rollers inside of the periphery, hanging between I beams which project from the rear of the trucks which carry the engine. These I beams can be quickly raised or lowered by the operator to regulate the depth of cutting. The machine, which is self-propelling, moves slowly but steadily forward as the trench is excavated. The material is delivered by the buckets on to an endless belt conveyor which discharges it at the side of the machine, as in the case of the one previously described. The largest machine thus far constructed digs a trench 4½ feet wide by 12 feet deep. Three men are employed in running it. In one instance where a 26-inch by 7-feet trench was dug in tough clay at the rate of about 800 lineal feet per day, the average daily consumption of coal was 1,500 pounds. It is stated that two years ago a ditcher to dig a trench 2 feet wide by 7½ feet deep could be bought for $4,800. One advantage claimed for the wheel machine over the endless chain is that the wheel can be kept much more steady than can the boom of the other machine, and consequently a more even and uniformly vertical trench can be dug.

Neither of these machines claims to be able to excavate heavy macadam or boulders. It is also evident that these machines are not practicable in treacherous soil, where each foot of trench must be supported by sheeting as soon as excavated, nor where numerous pipes and other structures lie in and across the trench, nor where the depth exceeds the dimensions given.

In the matter of sheeting trenches, there seem to have been few new ideas developed for a number of years past. The ordinary method of employing

rangers and braces, the latter being either sticks of wood sawed to the desired length or the ordinary adjustable ones, holding in place planks of hemlock or pine driven by mauls, is the common practice of sewer sheeting. Economy calls for the repeated use of this lumber, the sheeting being drawn as the trench is refilled and used again until battered to destruction. In hard ground, or that containing boulders or large gravel this battering takes place very rapidly. The writer has seen hard wood, such as maple, used with the idea of prolonging the life of sheeting, but with exactly the opposite effect, since the sheeting split to pieces much more rapidly than the softer wood had battered. Recently a few trenches have been sheathed with steel sheeting such as has in recent years come into use for cofferdams and foundation work. It hardly seems probable that this would be economical for shallow trenches or for soft soil, but where wooden sheeting would batter quickly, and where it is certain beforehand that it will not be desirable to leave the sheathing in the trench permanently, there would seem to be considerable advantage in the use of steel for this purpose. It would also seem to be a desirable material to use in quicksand if, as is claimed for most styles of this sheeting, it forms a water-tight construction, its ability to receive heavy pounding permitting it to be kept driven continuously below the bottom of the trench, and thus to prevent the inflow of quicksand from the sides.



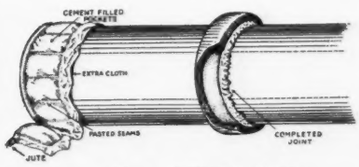
INTERLOCKING STEEL SHEETING IN TRENCH, CHICAGO, ILL.

Pipe Joints

In the construction of sewers in wet trenches, considerable difficulty is generally experienced in securing tight joints by the use of cement, the difficulty being really the double one of the necessity of extra tightness owing to the presence of the ground water, and also the fact that the cement softens in the water and runs out of the bottom of the bell unless some special precautions be taken.

In recognition of this, various special joints and joint-making materials have been devised, few of which have met with anything like general acceptance in this country. In England several patents of special pipe joints have been placed upon the market, a number of them involving the idea of providing an annular space into which liquid cement can be poured. In this country few if any special forms of pipe have been used, except that pipes having the length and width of the space between the bell and the spigot larger than ordinary, which are preferable for use in wet trenches, are made by most manufacturers. Several substances have been tried with greater or less success for making sewer joints, that which has found most general use probably being a mixture of sulphur and sand, which is melted and poured into the joint very much as lead is run in laying water mains, which substance was described in the Proceedings of the Convention of the American Society of Municipal Improvements for 1904, and which is sold by F. H. Pough, of New York, under the name of Pozite.

Asphalt has been tried for this purpose also, as has pitch mixed with sand and cement. Probably the latest attempt at solving this difficult problem is that of the Wet Sewer Gasket Company, of Syracuse, which sells a Gasket composed of a series of pockets filled with dry, neat, portland cement. The containing material is a coarse meshed cloth, through which the cement will readily pass on becoming moist, the cloth being filled with a sizing which prevents the cement leaking out, but which quickly dissolves in water. The cement-filled pockets are separated by pasted seams, in order to insure an even distribution of the cement all around the pipe. Along one edge of the gasket is a rope of jute, which is placed against the shoulder of the bell. The gasket is then inserted in the jointing space and calked home with a wooden or iron calking tool, the pasted seams meantime opening under the influence of the water and the cement, which oozes out, entirely filling the joint space between the pipes, the jute in the gasket meantime preventing the cement from entering the inside of the pipe. The outer edge of the gasket contains extra cloth, which is thoroughly calked into the joint space, making it impossible for water in the trench to injure the joint, while the jute prevents water which may be running through the pipe from washing the cement. It is seen that this results in a cement joint well compacted in the joint space and held from escaping and protected from water by a double gasket. Whether the cloth which is imbedded in the cement will later decay, and what the effect of such decay would be, are questions which we have not seen discussed. This gasket has been used in a number of cities, and so far has apparently given satisfaction. The cost of a joint made with these is, of course, greater than that of the ordinary cement joint, since nearly as much cement is used, and, in addition, the cost of the cloth and of the manufacture, sale, etc., must be added.



W. S. SEWER GASKET

SEWERAGE PUMPS AND LIFTS

Centrifugal Pumps, with Electric or Gas Engines—Shone Pneumatic Ejectors—Ellis Ejectors—Adams Sewage Lifts—Wilson's Hydraulic Ejector

By far the greater number of sewerage systems in the United States up to the present time have relied entirely upon gravity for carrying the sewage to the desired outlet or destination; but with the rapidly increasing number of disposal plants the pumping or lifting of sewage becomes of increasing importance, since the majority of such plants are of necessity so situated that the sewage cannot enter them by gravity alone. Another condition under which lifting must be resorted to is found in very level districts. To secure a self-cleaning velocity in the sewers, these must be given certain minimum grades which seem in themselves very small, but as a sewer extends for thousands of feet its depth is found to be increasing to such an extent as to render excavation very difficult. One illustration of this was in the almost dead-level grounds of the Chicago World's Fair, in which case the sewage was lifted several times in crossing the outlet from the far side of the grounds. A later instance is that of New Orleans. In designing this system the engineers adopted, as a more or less arbitrary and elastic standard, the rule that when the grade of the sewer had reached a depth of about 18 feet, a pumping station was to be constructed to lift it as near the surface as was thought practicable, from which point it would again begin its gradual descent. The development of this idea resulted in the establishing of three main pumping stations, at which is collected all of the sewage from a considerable territory; also three intermediate pumping stations, as well as ten sub-stations for the lifting of smaller quantities, as just described. There have been only a few other towns in this country where this systematic lifting of sewage has been employed in connection with any considerable area, and in most of these for special sections only.

For the lifting of the sewage it is, of course, possible to employ any of the ordinary pumping methods, especially applicable being centrifugal pumps, because of the absence in these of valves or other parts whose action is likely to be interfered with by matches, cloth or other matters carried by sewage. The pumps in New Orleans are vertical, centrifugal pumps, operated at the main stations by steam, but at the sub-stations by electric motors, power for which is created at the main pumping stations and brought to the sub-stations by wires laid in underground conduits. A great disadvantage connected with the use of steam for sewage pumping in the majority of cases is the small amount to be pumped at any one point, which brings the cost of the steam plant, with its attendant engineers, to a very high rate per gallon. Where the lifting must be done at two or more points, it is generally found cheaper to use some style of pump which does not require constant attendance, such as an electric, gas or gasoline motor. Where electricity is available, as from the wires of an electric power company, an electric pump is probably one of the most convenient for this purpose; and it has also been used in a number of cases where, as in New Orleans, the electricity was carried and the wires laid especially for this purpose. At Pittsfield, Mass., is an electric pumping plant which raises all the sewage of the town (50,000,000 gallons) to the disposal works, the pump being started and stopped automatically by a float in the pump well.

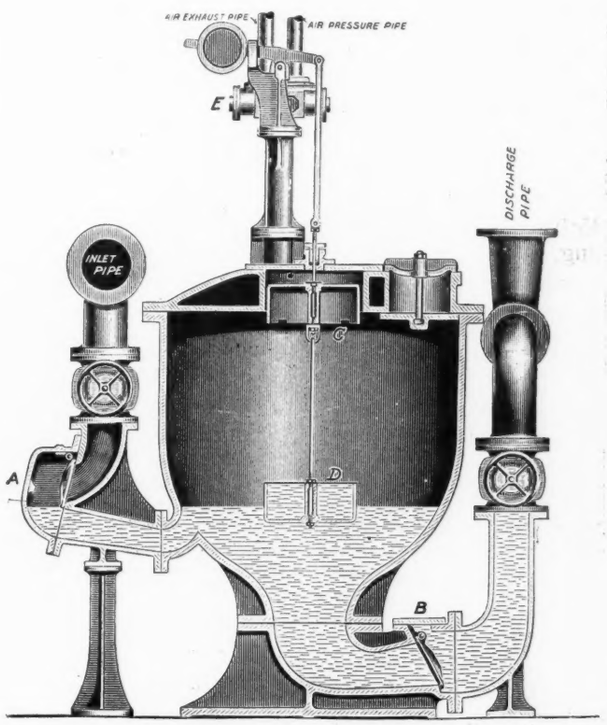
Mr. I. F. Farnham read before a recent meeting of the Boston Society of Civil Engineers a description of a sewage pumping plant at Newton Upper Falls. This plant served but thirty houses with a population of about 160, and a machine shop of a population of about 600. It consists of two 3 ½-inch submerged centrifugal pumps, driven by two 6 h.p. gasoline engines, either of which can operate either or both pumps, or both can be connected to either pump. The maximum lift is 30.7 feet and the capacity contracted for 1,500 gallons per minute. The plant is located near the waterworks pumping station, the fireman of which attends to it, starting the pump when an indicator notifies him of the filling of the sewage reservoir. The pump is stopped automatically when this reservoir is almost empty. The cost of this plant was $6,700, and that of the operation averaged $400 to $500 per year.

Mr. F. A. Barbour also described at this meeting a number of sewage pumping plants which he had designed, including plants at Saratoga, N. Y.; Hudson, Mass.; Fredericton, New Brunswick, Atlantic City, N. J., and others. At Hudson two small centrifugal pumps, driven by electric motors, raising 500 gallons per minute against a 35-foot head, cost $3,600 for pumps, motors and the piping. At Fredericton a plant of the same capacity, but operating against a lower head, cost about $3,000, including import duties. The same style of plant will be used at Atlantic City and located entirely beneath the sidewalk.

In the discussion of these papers it was suggested that, just as although theoretically a sewer of four or even less inches in diameter might have sufficient capacity for a given case, it was, nevertheless, thought desirable to lay none of less diameter than eight inches, so there was a minimum size of centrifugal pump, which would work satisfactorily without being stopped by floating matters, and that a 2½-inch pump was probably such minimum. It was stated that low rates were obtainable for electric pumping in many places because the heavier pumping occurred in the daytime, when the demands for light were less. It was also stated that such automatic pumps should

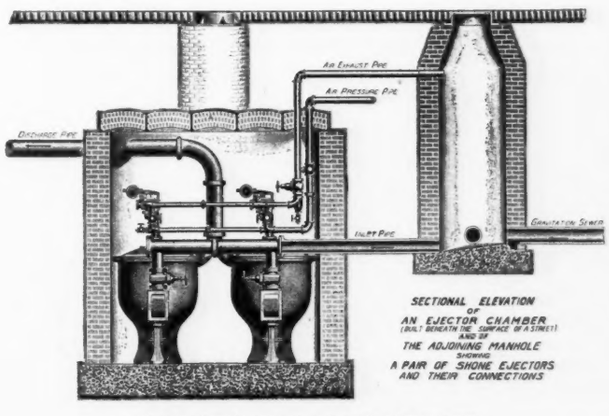
be looked at every three or four hours, since any failure of proper working would have very serious consequences. Other sewage pumping plants referred to included centrifugal pumps at Charlottetown, P. E. I., driven by Otto gas engines, which, it was stated, had frequently been left for three or four days at a time without any attention whatever. Mr. A. J. Gavett, City Surveyor of Plainfield, N. J., stated that a contract had been let to the Ingersol-Rand Co. for a sewage pump to serve a small section of that city, in which an air compressor driven by a Wagner electric motor will operate pneumatic displacement pumps, a gas engine being provided for emergency use in case of interruption of electric power. In several of these pumping plants there have been more or less frequent clogging of the pumps by cotton waste, the cities in these cases being manufacturing cities.

A centrifugal pump, even as small as 2½ inches, cannot be run successfully, however, at a less rate than 150 gallons per minute, which means that for a very small amount of sewage the pump must run intermittently, and the sewage be stored in the pump pit between operations, which storage offers several disadvantages, one of these being the accumulation of sludge in the pit. To meet this objection and others, for the lifting of sewage from the deep basements of large department stores, office buildings and the like, as well as for lifting the sewage of small city areas, other contrivances have been devised. One of the first of these which met with any considerable use was the Shone pneumatic ejector, which was first put on the market about 1880 and found considerable use in England and India. It is also used quite extensively for lifting the sewage and drainage of deep basements in the larger cities, especially Chicago. The drainage of the



SHONE PNEUMATIC EJECTOR. VERTICAL SECTION

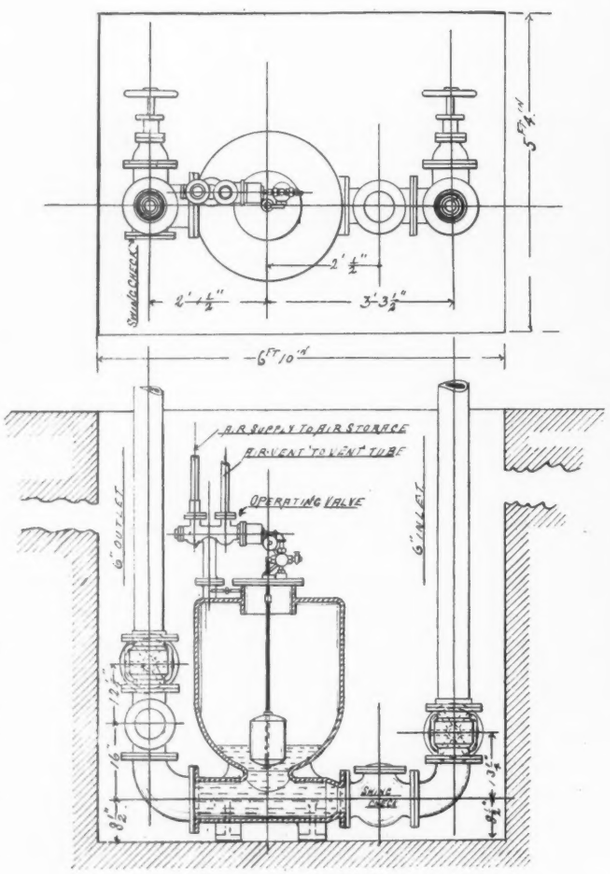
World's Fair at Chicago included twenty-six of these ejectors, and they have been used for low-lying districts of Winona, Minn.; White Plains, N. Y.; Charleston, S. C.; Fair Haven, Mass.; Portsmouth, Va.; Far Rockaway, L. I., and a number of other towns. This ejector consists essentially of a closed vessel furnished with a sewage inlet and discharge connections of diameters regulated by the amount of sewage to be handled, each of these being furnished with check valves (*A* and *B*) opening in opposite directions. On the cover of the ejector is placed the automatic valve *E*, to which is connected the pressure pipe from the air-compressor station. This valve controls the admission of air to and exhaust from the ejector. The raising or falling of the two castiron bells *C* and *D* operates the automatic valve *E*. The bells in the illustration are at their lowest position and the sewage can enter through valve *A*, the ejector gradually filling until sewage reaches the under side of the bell *C*. As it continues to rise it raises the bell, the automatic valve is thrown, and compressed air is admitted into the ejector, driving the contents of the same through the discharge valve *B* into the discharge main. Check valves on the inlet and outlet pipes prevent the sewage being forced into the inlet or flowing back from the outlet. These ejectors are operated, it is seen, by compressed air, which must accordingly be furnished, ordinarily by a special compressor, and when several lifting stations are used is generally piped from a central compressor station to each of the ejector stations. The compressor plant and air piping add considerable cost to such an installation, and this is one of the chief objections to the pneumatic ejector.


AIR EXHAUST PIPE
AIR PRESSURE PIPE
DISCHARGE PIPE
INLET PIPE
SECTIONAL ELEVATION OF AN EJECTOR CHAMBER (BUILT BENEATH THE SURFACE OF A STREET) AND OF THE ADJOINING MANHOLE SHOWING A PAIR OF SHONE EJECTORS AND THEIR CONNECTIONS

SHONE EJECTORS IN EJECTOR CHAMBER

Another style of pneumatic ejector, invented in this country and known as the Ellis ejector, has been used quite extensively for lifting sewage from the basements of the larger buildings in New York City. Two installations for town sewage have been made, one at Aldene, N. J., and one at West Orange, N. J.; and two are now under contract, one for Newark, N. J., and the other for Schenectady, N. Y. The Schenectady plant embodies the latest improvements, and is to consist of four ejectors, each of 100 gallons capacity, the air for which will be supplied by two electrically-driven air compressors, each

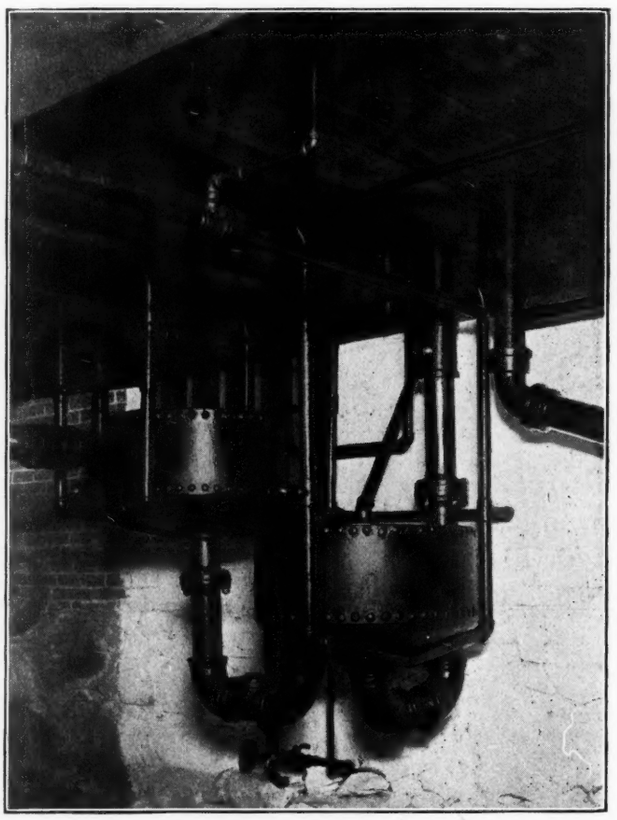
to compress at least 175 cubic feet of air per minute to the pressure of thirty pounds; also one air tank 9x4 feet. Under ordinary conditions two ejectors only will be in service, but any increase of sewage beyond their capacity will be handled automatically by one or both of the other two. Two A. C. motors of 220 volts, 60 cycles, 3-phase, furnish power to the compressors. In the floor of the ejector chamber a sump pit is provided to collect any ground-water leakage, and a small hand ejector for removing the same. The specifications provided that this apparatus be automatic in its action, required only such attention as may be necessary for oiling, adjusting of brushes and cleaning; that the air pump shall automatically maintain the required pressure and the intermittent operation shall continuously discharge all sewage without fail. The accompanying plan shows the latest design of this ejector, the operation of which is as follows: The sewage enters the receiving tank by the 6-inch inlet, and as it fills this tank it raises the float, which, when it has reached the desired height, opens an operating valve, when the air is admitted through the supply pipe into the receiving tank, driving the sewage therefrom into the 6-inch outlet; the inlet check having closed and prevented any back-flow into the inlet pipe. Before the receiving chamber is quite empty the float falls to such a point as to reverse the operating valve, cutting off the air supply; the outlet check at the same time closing and preventing any back-flow from the outlet pipe.



ELLIS EJECTOR. PLAN AND VERTICAL SECTION

Another English invention is the Adams sewage lift, which uses water instead of air. This lift was introduced into this country several years ago. In it no moving parts are required in the sewage receptacle other than plain flap valves. This advantage is secured by employing water columns in lieu of valve mechanism, by which the release pipe is sealed during the time that the air pressure is applied, but which is automatically unsealed immediately the compressed air has completed the discharge of sewage. In lieu of an air compressor Adams employs the intermittent flushing of water, which, passing down a pipe (of greater vertical length than that of the rising main), compresses air to the necessary pressure, after which a volume of sewage is lifted and discharged equal to the remaining volume of water which passes from the flush tank. Merritt & Company, United States agents for the Adams lift, have recently perfected an air-controlling device by which air supplied by an air compressor may be utilized for raising sewage in a similar manner to that employed in the Shone and other types of sewage ejectors, but following the principle of the Adams sewage lift, and thus obviating the necessity for floats, rods or other mechanism in the sewage cylinder.

This mechanism has been placed in basements and street vaults, and the upper tank in some cases has been elevated upon a post at the curb line.



ADAMS SEWAGE LIFT, INSTALLED IN A BASEMENT

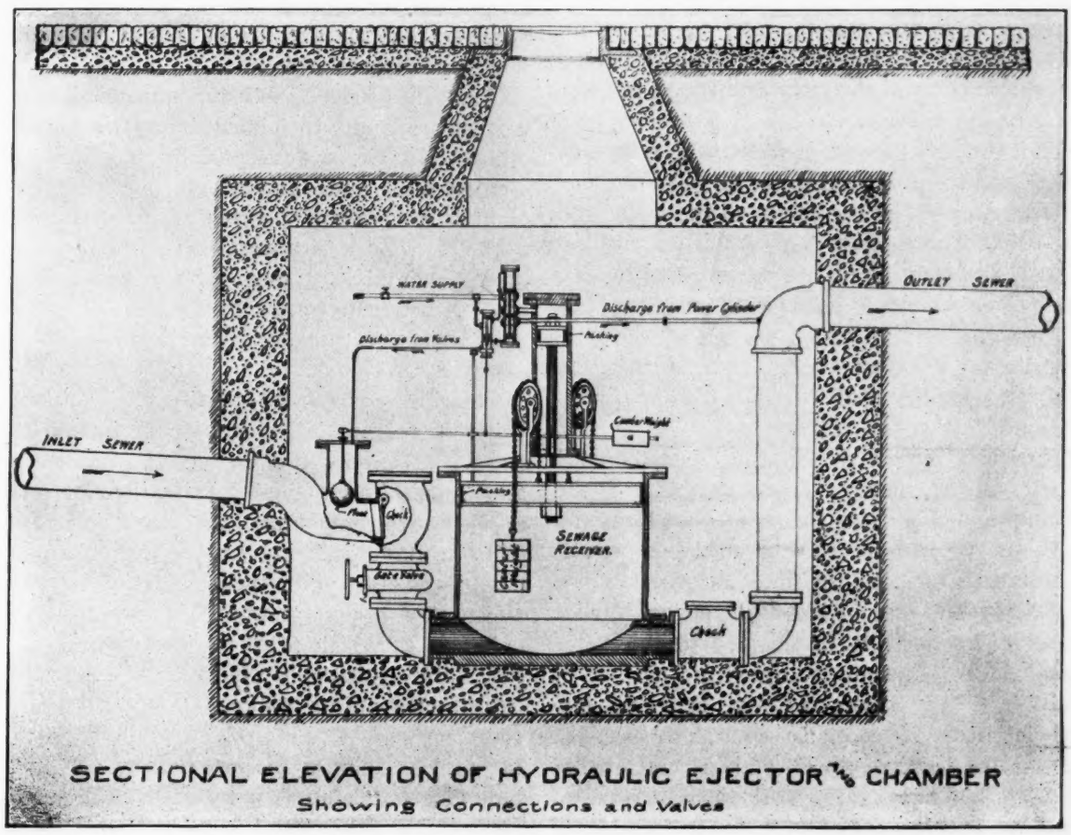
The latest type of ejector is one designed by Mr. E. A. Wilson, Assistant City Engineer of Duluth, Minn., one of which has been in use in that city since November 7, 1906, and up to the middle of last month is reported as having

worked successfully and uninterruptedly; and a petition is now being circulated for the installation of a system involving the use of ten of these, ranging in capacity from 70 to 300 gallons per minute. The ejector now in use has lifted between 25,000,000 and 26,000,000 gallons of sewage at an expense to the city of $21.80. One of the great advantages of this ejector is that it uses water under the ordinary pressure from the mains rather than compressed air, and consequently does not involve the considerable expense for air compressing plant and compressed-air pipes, which are required by the pneumatic ejectors.

The ejector apparatus is sold in three sizes—one of 70 gallons per minute, one of 150 gallons, and one of 450 gallons—the prices being $850, $1,250 and $1,400 respectively, f. o. b. Duluth. The 450-gallon ejector weighs about 10,000 pounds. The cost of the chamber herein described, together with all work and material in connection with the installation (day labor being employed), such as excavation, replacing sandstone pavement, connection with main, lumber, brick, steel reinforcement of roof of chamber, sand pumps, etc., was $663.07, and assembling, connecting and adjusting the apparatus cost an additional $125.

Mr. Wilson describes the construction and operation of his ejector as follows: "The chamber containing the ejector is built on the side of the main sewer, the course of the sewage describing a semi-circle through the inlet to the ejector, which raises the sewage three feet and discharges it through the outlet pipe. The ejector chamber is built of concrete, the lower part being built around a steel tank of a height calculated to prevent the ground water from seeping through, its head being ordinarily about 6 feet. The chamber is elliptical in form, 11 feet in length by 7 feet 6 inches in width and 12 feet deep.

WILSON'S DULUTH HYDRAULIC SEWER EJECTOR



WILSON'S HYDRAULIC SEWER EJECTOR. VERTICAL SECTION

The part of the inlet pipe belonging to the ejector consists of a curved pipe provided with a float chamber, a check valve and clean-outs. A gate valve is provided for, so as to shut off the inflow of sewage if necessary during repairs to the apparatus. The bottom part of the ejector, which is a spherical segment, contains provisions for connecting the inlet and outlet pipes to the apparatus. The sewage receiver, which is bolted to the bottom section, is a bored cylinder 48 inches in diameter. The outlet pipe is provided with a check valve, for obvious reasons. The upper flanged end of the sewage receiver has a ribbed cover, to which is bolted an 8-inch bored cylinder. The two cylinders are provided with pistons and rod arranged tandem, the small piston acted upon by the direct water pressure from the mains overcoming the resistance of the sewage against the larger piston. The large piston is provided with a manhole for the inspection of the interior of the cylinder. It is counter-weighted to overcome the friction in the apparatus plus a certain percentage of the weight of the pistons themselves. The small piston is packed with a rubber canvas packing; the sewage piston with hemp packing.

The water from the mains passes through a one-inch lead pipe and is admitted to the power cylinder through two small piston valves. These valves are worked automatically. During the filling of the sewage receiver the water is completely shut off. When the sewage has lifted the piston to the upper end of the stroke a head is created under the float in the inlet pipe. This raises a lever which is connected by means of a rod to the small controlling valve and reverses it. This admits about two spoonfuls of water under city pressure, which reverses the large piston valve and admits water to the power piston, which in descending moves the large piston before it and ejects the contents of the receiver through the outlet pipe into the upper sewer.

At the end of the stroke a rod, provided with a set collar at the upper end and secured to the large piston, engages the lever and reverses the valves, at the same time opening the exhaust ports, from both the valves and the power cylinder, and shutting off the water supply. The water in the power cylinder is now forced into the sewer outlet by the rising sewage piston as fast as the new charge is received. The apparatus is made of cast iron, with the exception of the small valves, which are brass. These valves are leather-packed.

In this particular ejector the amount of water used is 3 per cent. of the amount of sewage pumped, the pressure being something less than 100 pounds to the square inch. As the pressure available in the mains will differ in different cities and in different parts of the same city, it is apparent that the size of the power cylinder of each ejector will need to be adapted to the water pressure available; the height of lifting and amount of sewage to be handled will also, of course, be special factors in the design. It is more economical to have the sewage receiver of large diameter, with a short stroke, as the head which the apparatus works against must be figured from the lowest point of stroke.

STERILIZING SEWAGE EFFLUENTS

Paper Reviewing Literature on the Subject — Boiling — Caustic Lime — Ozone — Chlorine — Cost of Various Treatments

In connection with the discussion of sterilizing sewage effluents which has been occupying more or less of the attention of sanitarians in England, as discussed in the Municipal Journal recently, a paper upon this subject contributed to the *Technology Quarterly* by Earl B. Phelps and William T. Carpenter is of considerable interest. In their review of the literature upon this subject they refer to the suggested use of heat, but the rough calculation of the anthracite coal required for raising sewage to the boiling point from an average temperature of 60 degrees F. gives 40 tons per million gallons, costing $100 or more. The claim that sufficient ammonia can be recovered to nearly repay the cost of the fuel is answered by the estimate that a million gallons of Boston sewage contains about 100 pounds, which, for concentrated commercial strength of 28 per cent., would bring $40, and this is the maximum theoretical return possible.

Caustic lime acts as a weak germicide, Rideal stating that 60 to 70 grains are inefficient in sterilizing. Most bacteria are more sensitive to acids than alkalids. Rideal states that 0.05 per cent. of sulphuric acid has been fatal to cholera in fifteen minutes, and 0.02 in twenty-four hours; that 0.08 per cent. sulphuric acid was fatal to typhoid in fifteen minutes. One million gallons of sewage would require 6,640 pounds of acid for an 0.08 per cent. treatment, costing approximately $332; so that the expense of this also would seem to render it impracticable.

Ozone has been highly recommended by many investigators and proclaimed impracticable by many others. In Germany especially has it been experimented with quite extensively, and an experimental plant is now being operated at the Jerome Reservoir of the New York City water supply, and is looked upon quite favorably by some of the engineers who are making the tests. Like so many other processes, the chief objection to ozone so far seems to have been its expense.

Chlorine seems to be considered by the authors as being most practicable in one of its various forms, those considered being the gaseous oxides of chlorine and the chloride of lime. With the electrical process as used at Niagara Falls, where electric energy is cheap, chlorine and bleaching powder are manufactured at comparatively small expense, the latter being sold at 1 cent per pound guaranteed 40 per cent. available chlorine, at which price the cost of adding one part per million available chlorine to sewage would be 21 cents per million gallons. The authors believe that the reaction of this in sewage would be such that it is not safe to count upon more than 75 per cent. of available chlorine being actually used. Free gaseous chlorine, on the other hand, is all available for immediate

use; it adds nothing to the amount or hardness of the sewage and possesses certain other advantages. It is believed that free chlorine, if demanded in large quantities, could be manufactured more cheaply per unit of available chlorine than could chloride of lime.

Considerable has been written recently concerning copper salts, especially copper sulphate, as a germicide. The cost of this would seem to be considerably greater than that of chlorine, and its use not as certainly beneficial. Reference also is made to permanganates and to the Amines process, neither of which are given serious consideration.

The authors, in conclusion, state that, while it is not the ordinary function of sewage treatment to remove bacteria, where extensive shell fish interests are at stake it will sooner or later become necessary to protect neighboring waters from pollution, and in this case the total absence of pathogenic bacteria must be assured, which result may be attained by the use of sand filters or by chemical sterilization. Among the possible agents for the latter chlorine, either as chloride of lime or as free gaseous chlorine, appears to have the highest cost-efficiency. The amount of the former which will yield 5 parts per million of available chlorine has destroyed 99.96 per cent. of the total bacteria and practically all of the B. coli present in the effluent of a trickling filter treating crude Boston sewage with a two-hour contact, and at an estimated cost of $1.05 per million gallons of sewage. It was estimated that if gaseous chlorine were used in large quantities the cost of the same amount of chlorine could be reduced to 85 cents per million gallons.

RECENT SEPTIC TANKS

Plant at Newton, N. J., of Reinforced Concrete—Details of Construction—Plant at Belleville, Ill.—Double Septic Tanks.

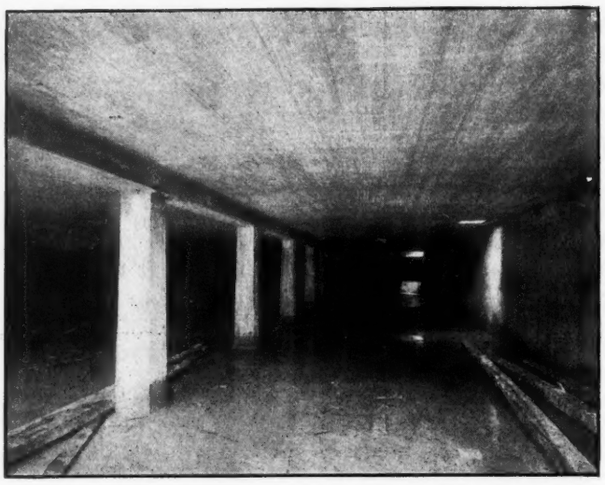
NEWTON, N. J., has recently completed two septic tank plants, one to care for an estimated discharge of 297,500 gallons per day, the other for 127,500 gallons, both very much alike in design and operation. Two plants for this town of only 5,000 population were required because of a high ridge dividing the area into two slopes.

The larger plant, the dimensions of which are shown on the accompanying plan, which cares for the major portion of the town, is designed to detain about eight hours' flow of a total maximum daily flow of 297,500 gallons. The raw sewage runs from the outfall sewer into a small cut-out or detritus chamber, from which it flows through a valve directly into the septic tank. The septic tank is built in two sections, one holding two-thirds and the other one-third of the total flow. From this detritus chamber it can be turned into either or both of these sections, depending on the amount of sewage and the desired duration of detention. Baffles are set inside of these valves so that the incoming sewage will not disturb the scum in the tank. After flowing through the tank, which, as before said, will require about eight hours, the sewage passes from the tank over an adjustable weir which may be raised or lowered by hand, thus permitting the quantity of sewage retained in the tank to be further adjusted. The outfall end is protected with a baffle wall, as was the entrance, in

NEWTON, N. J., SEPTIC TANKS UNDER CONSTRUCTION, SHOWING REINFORCEMENT

order to keep the scum from being carried away. The effluent of the septic tank is stored in the dosing chamber, which holds practically two hours' flow, and is automatically emptied into five filter beds in rotation. The plant is designed so that any one of these five beds may be held at rest.

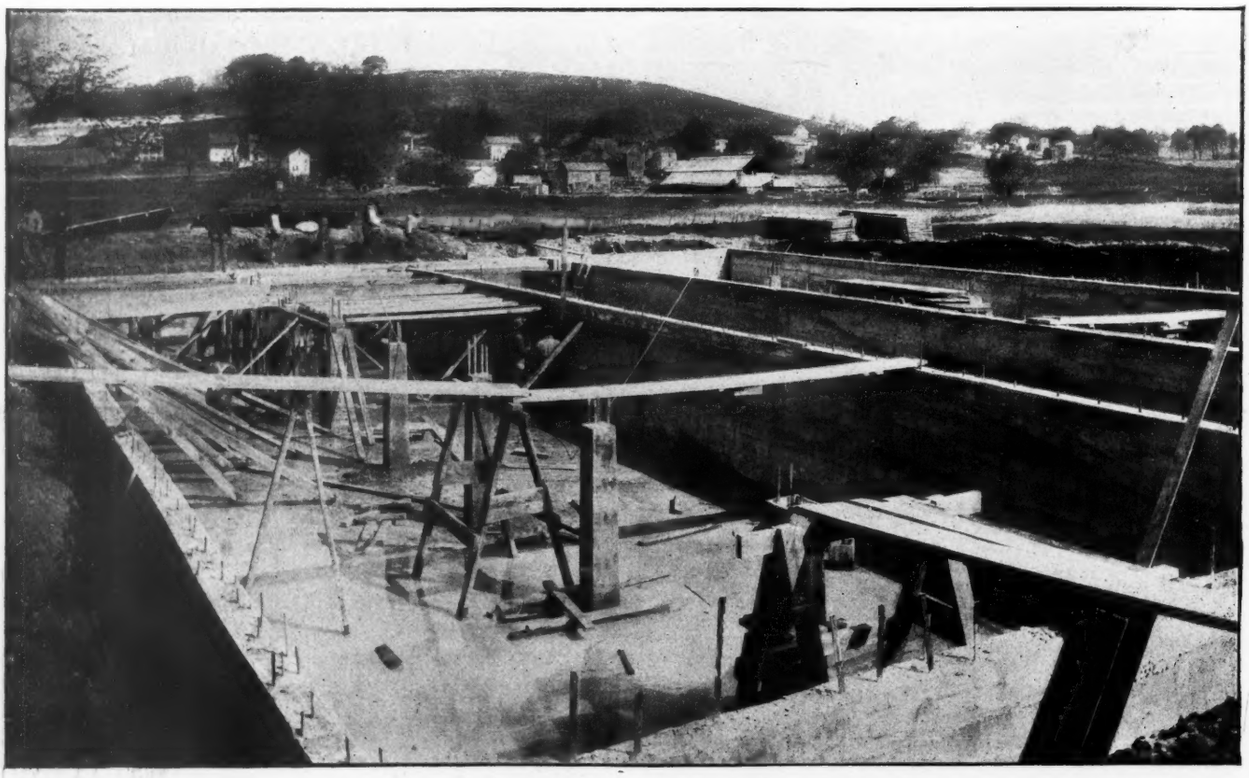
There are several notable points in the design of the septic tank which are worthy of mention. First, the accommodation to a varying flow above mentioned, with the outfall weir for further adjustability. Second, a valve in the detritus chamber whereby the raw sewage may be by-passed around the septic tank. Third, valves in the bottom of the septic tank whereby the sludge may be emptied onto a sludge bed by gravity. Fourth, the septic tank is designed of reinforced concrete, the reinforcing in the walls being plain steel bars, as shown in the illustrations.



NEWTON, N. J., SEPTIC TANK—INTERIOR VIEW

The tank was designed to be reinforced throughout with expanded metal, but at the time the work was started the expanded metal could not be had so as to finish the tank in contract time and the contractor was allowed to use plain steel bars, 3-4 by 3-16 inch.

In building the tank the floor was first laid, the lower ends of the reinforcing bars of the walls being set in the green concrete. After the concrete had set these bars were so firmly bonded with it that they could not be pulled out. The forms were then set around these bars and the concrete moulded into them. In addition to the reinforcing, the walls were keyed into the floor, the recess for the key having been formed by laying a piece of 2 x 4 timber in the green concrete. The vertical reinforcing bars were spaced 16 inches, center to center, and three horizontal bars were spliced to these, the total height of the tank being 7½ feet. The horizontal bars were laced into the vertical bars so as to make a rigid mat of reinforcing. After the wall on the upper side of the tank had been completed, and before the roof was laid, it was subjected to a very severe test. The wall was originally designed to act as a cantilever, and the roof was not calculated to support the top of the wall. Before the roof was laid a heavy rain storm washed the excavation between the wall and the tank full of mud, and the wall, with the top unsupported, was thus subjected to its maximum hydrostatic pressure, and, acting as a cantilever, supported fully eight feet of liquid mud. This test also



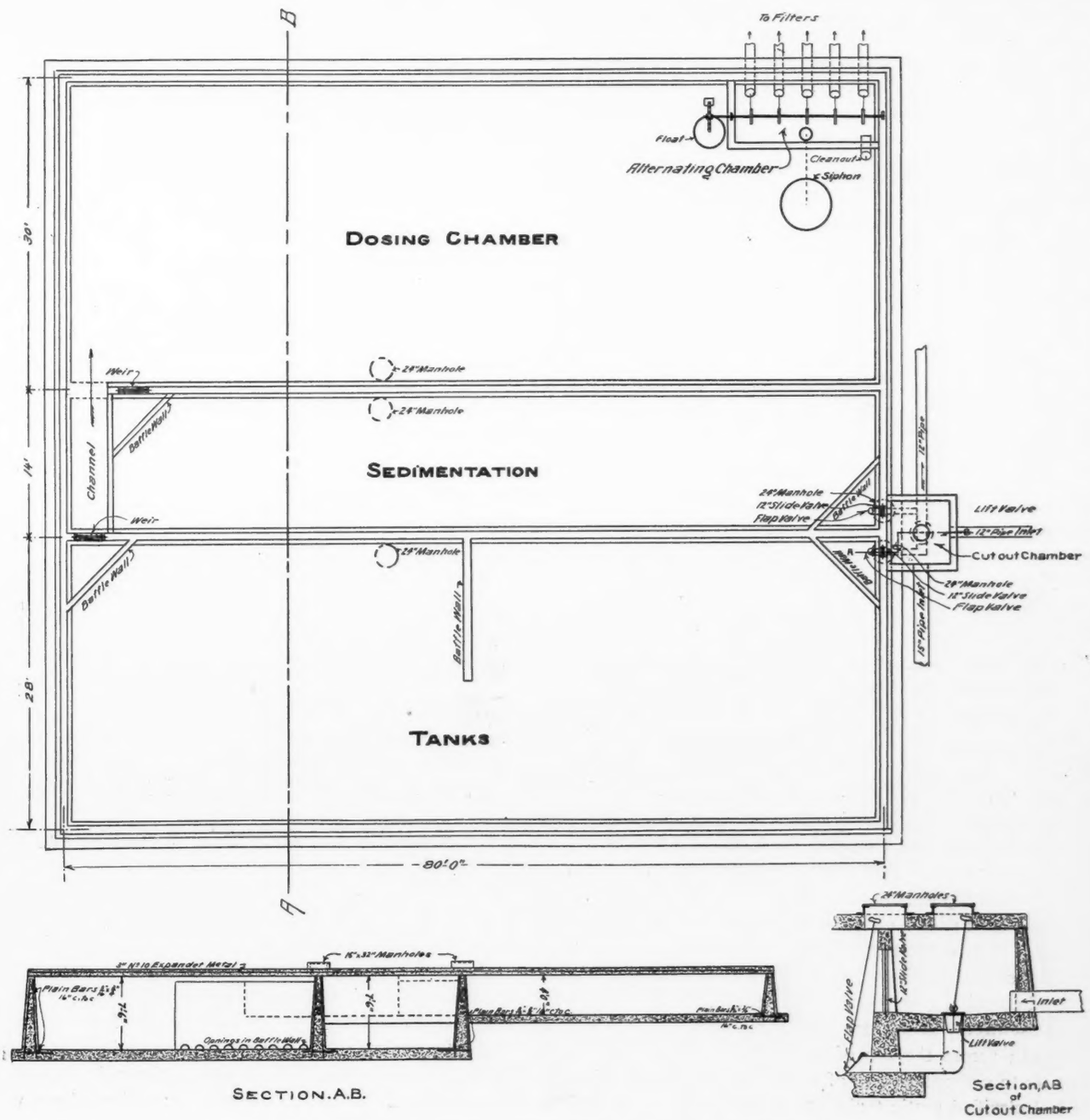
NEWTON, N. J., SEPTIC TANKS, STARTING ROOF CONSTRUCTION

demonstrated the water tightness of the wall, which was made of concrete mixed so wet that it could be poured and moulded inside of the forms. The illustration gives a very clear indication of the smoothness of concrete mixed very wet. The concrete in the floor of the septic tank cost between four and five dollars per yard. The walls about twelve dollars per yard, and the roof between twelve and fifteen dollars. The excavation was a very expensive piece of work, the ground at the location of the tank being filled with springs. The total cost of the tank was in the neighborhood of $4,500. The roof was reinforced with 100% 3" No. 10 expanded metal. The vertical reinforcing bars of the walls extend up into the roof and act as dowels.

The tanks, as well as about 5½ miles of sewers, were designed by and constructed under the superintendence of Williams, Proctor & Potts, of New York. Hinman & Sproul, of Schenectady, N. Y., were the contractors for the disposal plants.

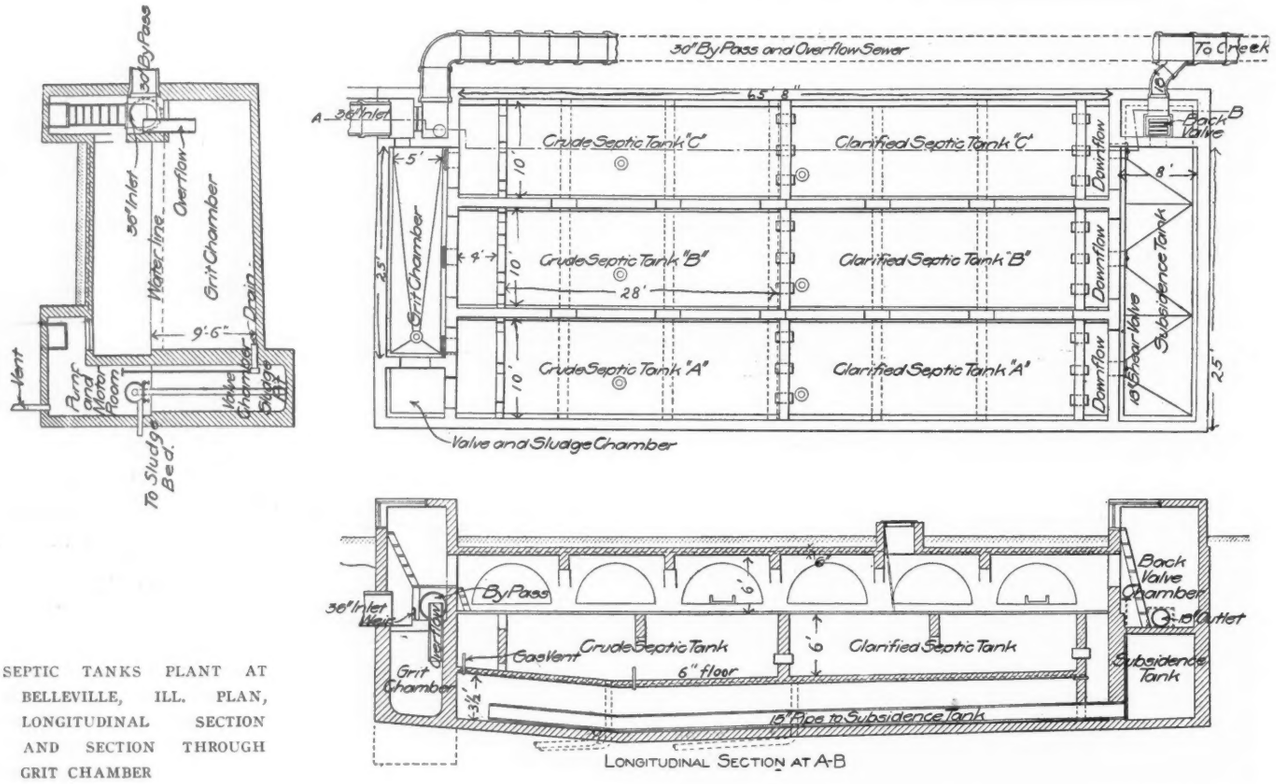
Belleville Septic Tanks

One of the latest septic tanks to be built in Illinois, a State which now contains probably more of these than any other in the country, is the one at Belleville, a city of 19,000 population, designed and built by Lewis & Kitchen, of Chicago and Kansas City. This plant consists of seven main sub-divisions, a grit chamber across the inlet end of the plant, three double septic tanks and a subsidence



NEWTON, N. J., SEPTIC TANKS. PLAN AND SECTIONS

tank across the outlet end. These are all placed in one structure entirely under ground and built throughout of concrete, with considerable steel reinforcement. The general layout of the plant is shown by the accompanying illustration. The structure is 34 feet 4 inches by 84 feet in plan and has a maximum depth of 19 feet 6 inches. The whole is covered by a reinforced concrete roof carried by five transverse arches springing between the longitudinal division walls of the tanks. The floors of the septic tanks slope to clean-out pipes, to which is also connected the subsidence tank. Sewage is brought to the plant by a 36-inch outlet main and enters the grit chamber, from which, after depositing the heavy matter, it enters one or more of the crude septic tanks. As the sewer system receives rain water, which it is not proposed to treat in this tank, a 30-inch by-pass is provided to carry the surplus to the creek in time of storms. A 12-inch overflow pipe is also provided in the inlet chamber extending 6 inches above the crest of the by-pass weir, which leads any overflow into the grit chamber and prevents the inlet chamber from being flooded. The grit chamber is connected with each of the crude septic tanks by a 15-inch circular orifice which is provided with a sluice gate permitting regulation of the flow. Across each crude septic tank and 4 feet from the inlet end of the same, is placed a 9-inch concrete baffle wall containing openings to effect uniform distribution of the sewage. A 13-inch transverse baffle is placed mid-length across the top of each crude and clarified septic tank to prevent motion of the scum. Each pair of crude and clarified septic tanks are connected by three 10-inch circular openings placed 3 feet below the surface of the sewage; and similar openings afford outlets from the clarified septic tanks to the downflow chambers. These downfall chambers connect with sub-compartments underlying the septic tanks, in which are placed 15-inch pipes connecting with the subsidence tank. The effluent from the septic tanks must enter this sub-compartment and pass out through this 15-inch pipe to a subsidence tank, from which an 18-inch outlet carries the final effluent to the creek. All of the septic tanks and sub-compartments are provided with drains by which the sludge can be drawn off to the sludge pit, in which is placed a 4-inch centrifugal pump, operated by water motor, which raises the sludge onto a sludge bed placed on an embankment over the tank. This sludge bed is 14x25 feet in plan and is composed of 2 feet 6 inches of gravel underlying 2 feet of sand, the whole enclosed in a concrete box from which the effluent is led to the creek by an 8-inch pipe. This sludge bed is not shown in the illustration.



SEPTIC TANKS PLANT AT BELLEVILLE, ILL. PLAN, LONGITUDINAL SECTION AND SECTION THROUGH GRIT CHAMBER

STANDARD SEWERAGE REPORTS

Forms Proposed By American Society of Municipal Engineers and Boston Society of Civil Engineers—Value of Adopting Standard Form

Attention has frequently been called by this journal to the desirability of reform in municipal accounting and statistics, and of uniform methods of preparing these, which would admit of something like intelligent comparison between individual cities. Of the various municipal departments dealing with public works only the water departments have so far adopted a standard form with anything like unanimity.

For the tabulation of sewerage statistics at least two different forms have been proposed, one by the American Society of Municipal Improvements, the other by the Boston Society of Civil Engineers; the former providing for much fuller detail in statements concerning work done during the year—possibly less likely of adoption on that account. The two forms are given herewith in full. It is greatly to be hoped that one or the other of these will be adopted by many more cities than have as yet done so. We know that not only would cities derive great benefit from the resulting ability to compare statistics, but that many would be surprised to discover how much there was about their own system which they did not know, which knowledge alone would suggest possible reforms.

FORM FOR SEWERAGE REPORTS

Proposed by American Society of Municipal Improvements

General Statistics

Systems in use: separate or combined.
Method of disposal of sewage.
Interceptors?
Sewage allowance per capita.
Storm water formula or rule, with reason for any modifications.
Discharge formula.
Special local features affecting system.
Guarantee period under contract.
Location of sewer in street; center, sidewalks, single or double line for street, etc.
Rule for depth.
Y or T branches used or not; if so, on what sewers; if not, manner of making house connections.
Difficulties of maintenance encountered.
Flushing methods.
Have sewers ever been overtaxed? If so, particulars.
Is sewage pumped? If so, what kind of pumps.

Construction Data

Amount of pipe sewers in use at beginning of year.
Amount of other sewers in use at beginning of year.
Amount of each laid during year.
Amount of each at end of year.
Size and forms used, circular, egg-shaped, pipe, etc.
Lining material.
Average amount of each size built per day.
Character of excavation; average and extremes.
Foundations used, if any.
Special constructions.
Concrete, methods of mixing and placing.
Methods of consolidating trench backfilling.

Labor and Materials

Cost of materials, cement, sand, brick, gravel, broken stone, pipe, etc.
Cost of labor per hour, different classes.
Cost of wagons and carts per hour.
Cost of foremen.
Cost of superintendence.
Cost of excavation per cubic yard.
Cost of sewer.

Financial Data

Total amount expended during year for sewers.
Total amount expended to date for sewers.
Manner of raising money expended.
Total amount of outstanding indebtedness; city's portion; property owners' portion.
Proportion of cost paid by the city and property owners.
Method of assessment, by frontage or area of contiguous property.
If non-contiguous property pays any portion of cost, state manner and amount.
Methods of paying assessments.
Bond issue, if any, period, amounts, interest, redeemable; whether general city charge or lien on property assessed.

FORM FOR SEWERAGE REPORTS

Recommended by Sanitary Section of Boston Society of Civil Engineers

(Filled out for the City of Cambridge, Mass.)

General Statistics

Population by census of 1905	97,434
Total area of city or town	6.535 sq. mi.
Area served by sewerage system	About 6.00 sq. mi.
Collection system, for sewage only	18.065 mi.
Collection system, for sewage and surface water	110.061 mi.
Collection system, for surface water only	5.635 mi.
Method of disposal	Discharge into ocean by the Metropolitan (State) sewer.

Collection of Sewage

Mains

(Everything but house and catch basin connections)

	For sewage only.	For sewage and surface water.	For surface water only.
Lineal feet extended during year	13,775	190	2,059
Method of flushing	By use of hydrant hose.		
Method of cleaning	By scraping and flushing.		

House Connections

By whom made	By property owners.
Sizes	6 inches diameter.

Catch Basins

Number	
Number cleaned	
Average amount of material removed per catch basin	
Cost of removing material per cubic yard	
Cost of removing material per catch basin per year	

Discharge of Sewage

Estimated population using sewer system	97,000
Number of buildings connected	estimated 15,000

Financial—Construction

Receipts		*Expenditures*	
Bonds issued		Collection works:	
Appropriation	$78,068.84	Mains	$71,426.04
Assessments not available for expenditure	6,099.96	House con.	
		C. basins.	
		Balance	6,642.80
			$78,068.84
House connections			
Other sources		Unavailable	6,099.96
Total	$84,168.80	Total	$84,168.80

Maintenance and Operation

Receipts		*Expenditures*	
Appropriation	$20,000.00	Administration	$2,387.06
		Repairs	3,036.98
		Cleaning sewers	1,996.22
		Cleaning catch basins.	6,060.54
		Flushing sewers	391.44
		Unclassified expenses.	4,736.41
		Balance	1,397.35
Total	$20,000.00	Total	$20,000.00

Interest on bonds	
Sinking fund	

General

Total cost of collecting mains	$1,995,001.27
Total cost of works to date	
Bonded debt at date	891,000.00
Value of sinking fund at date	
Average rate of interest on bonds	3½%
Proportion of cost of system assessed on abutters	Estimated at ¾
Yearly assessment for maintenance	Nothing
Method of assessing abutters and rate of assessment	Based on frontage and area of lot within 100 feet of street

FOOD INSPECTION AND LABORATORY

How Birmingham Inspects Her Meat and Milk Supply—Methods and Amount of Work Done—Bacteriological Laboratory

By E. M. DUNCAN, B.S.,
Bacteriologist and Chief Inspector.

THE meat and milk inspection department of the city of Birmingham was established in 1900, by the Mayor and Board of Aldermen on the recommendation and cooperation of Dr. C. A. Cary, State Veterinarian and Professor of Veterinary Science, at the Alabama Polytechnic Institute.

The department was established to regulate the sale of meat and milk, and to prevent any diseased or unwholesome meat and milk from being sold or offered for sale.

At first three inspectors, a chief and two assistants, were employed to carry on the work of inspection. At present the department has four inspectors.

According to the law the inspectors are required to pass a satisfactory examination before an efficient veterinary board of examiners, and they must have an accurate knowledge of the kind and nature of the various diseases common to the domestic animals, before entering into the service as inspectors; while the chief inspector is required to be a bacteriologist and an analytical chemist.

The inspectors serve on a salary basis, and are paid by the city treasurer as other city officials are paid. The department is maintained by a fee system, through a nominal fee collected on each inspection made. It can thus be seen that the expense of carrying on the work is not a tax on the city treasury. Neither are the small fees for inspections collected from the dealers a burden to them, since the reputable dealers attest to the fact that the inspection is a protection against the practices of the unscrupulous dealers, which is worth many times more to them than the cost of inspection.

The total expense of the Birmingham department for the year 1906 was $4,481.74, including salaries and amount expended for apparatus for the laboratory. The department has been self-sustaining.

Meat Inspection

All animals to be consumed for human food in the city are required to be slaughtered in a properly constructed slaughter house, being amply supplied with refrigerating facilities for taking care of the dressed meats, an abundance of fresh, pure water, and satisfactory arrangements for disposing of all offal (which is manufactured into fertilizer or otherwise satisfactorily disposed of). The slaughtering of all animals is under the direct supervision and inspection of an inspector of the department, and no animal is allowed to pass for sale as food unless it be suitable for same. Both antemortem and postmortem inspections of animals are made. In this manner a double assurity of detecting such diseases and conditions as might render the meats of the animals dangerous or deleterious to public health is gained.

During the past year the following number of animals were thus inspected: Cattle, 3,371; hogs, 5,428; sheep, 1,013; veal, 3,392; kids, 824.

Also the following number of animals, classed as "Western" in the dressed form, were handled by the local branches of the large packing house corporations, and were carefully inspected by the department: Cattle, 18,209; hogs, 6,604; sheep, 8,347; veal, 1,628. This shows a total of 48,816 animals inspected, with 4,990,934 pounds of other fresh meats exposed for sale in the city during the year and inspected by the department.

It is true that nearly all of the fresh meats handled locally by the branches of the large packing house establishments have been inspected and approved by the government inspectors. At the same time this is not a guarantee that the meat will be in good condition when it reaches this market. It is often subjected to much delay in transit, owing to exhaustion of the ice supply in the refrigerator cars, to a very congested condition of the market; and in unfavorable weather much of this meat may be spoiled, or otherwise rendered unfit for human food. Hence it is necessary for the city to watch over this branch of its meat supply.

No person, firm or corporation is allowed to buy or sell any fresh meats until it has been inspected and approved by the stamp of the department.

All of the retail meat markets in the city are also inspected regularly, and all meats found unsuitable for use as food are condemned. A total of 53,084 pounds of meats and 6,400 pounds of fish were condemned during the year as unfit for food for various reasons and destroyed as tankage in the presence of an inspector.

A total of 42 animals were rejected before slaughter for various reasons.

Milk Inspection

About one hundred and twenty dairies produce the supply of milk for the city of Birmingham, located from one to ten miles from the city limits. They are visited and inspected regularly by an inspector of the department. Each time a dairy is inspected all of the conditions surrounding the same necessary to be considered in the production of a pure, wholesome milk are carefully investigated; the physical condition and health of the cows, including their water and food supply; places, methods and manner of handling the milk; the sanitary conditions of the barns, milk houses, and so on. When a dairy premises is found in an unsanitary condition, the owner or proprietor is served with a written notice and given the ten-day limit to get the same in a sanitary and acceptable condition. Failing to comply with the requirements, the dairyman is suspended from selling milk in the city until he can comply with the same.

All dairymen are compelled to make application at the office of the department for a permit before they can enter into the dairy business in the city, and this permit is issued only after the departmet has made an investigation of the dairy and its premises and found the same satisfactory. Each dairyman is required to have a neat.

clean wagon, with cover to keep out the dust, and to protect the milk from the heat of the sun, which wagon must be used exclusively for the delivery of milk. It is the requirement that no milk be delivered in the city above 50 degrees Fahrenheit.

Milk and cream offered for sale in the city must come within the following minimum requirements: *Milk:* Specific gravity at 60 degrees Fahrenheit, 1.029 to 1.033. Water, 87.5 per cent. Fat, 3 per cent. *Cream:* 18 per cent of fat. All foreign matter, either as a preservative or as an adulteration, is prohibited from being added to milk intended for sale in the city.

Samples of milk are collected from the dairymen as often as deemed necessary. These samples are all carefully tested to ascertain the amounts and relative proportions of the normal constitutents and for chemical or other adulterations.

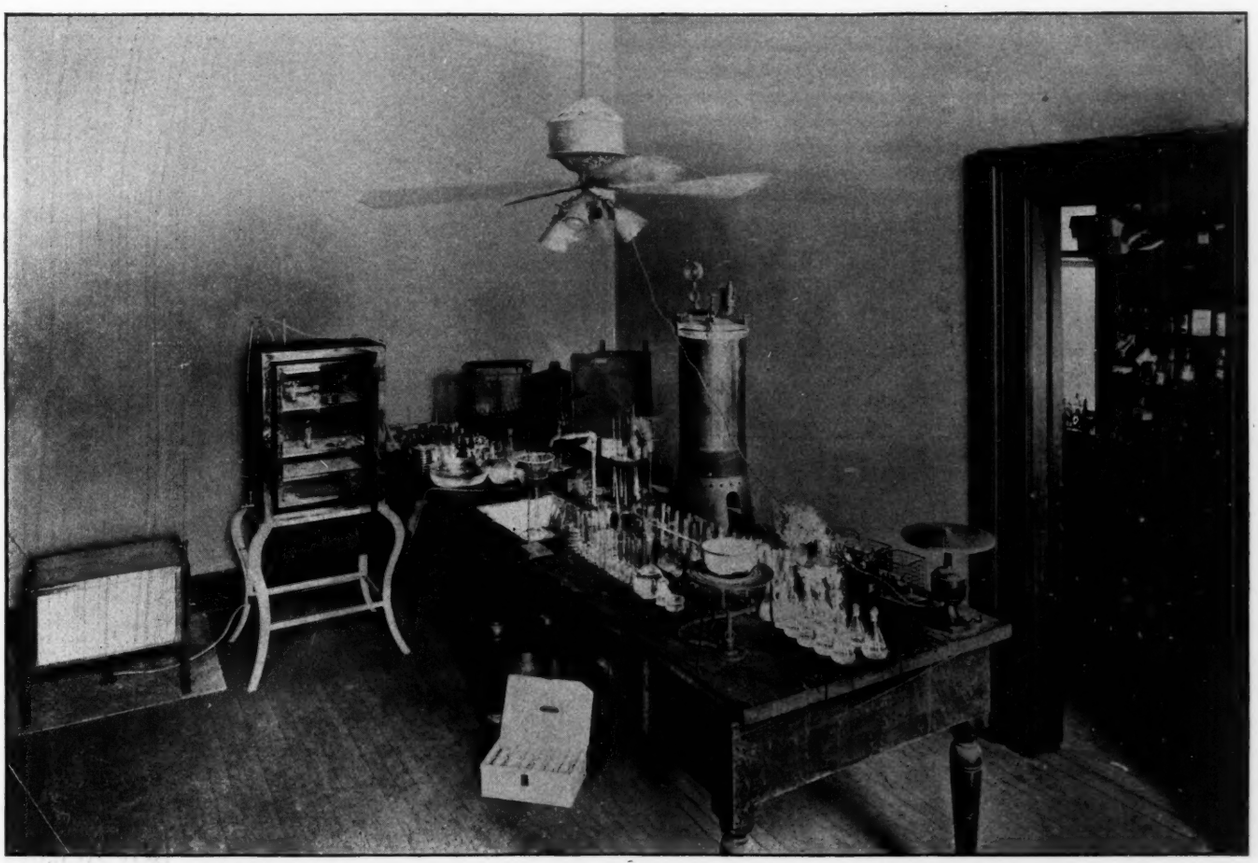
The samples of milk for analysis are always secured from the dairymen while en route, so it is practically certain that the milk delivered to the customers is of the same quality as that analyzed.

No cows known to be infected with tuberculosis or in any way diseased as to render the milk produced by them dangerous or deleterious to health, are allowed to remain in a dairy herd supplying milk to the city.

The tuberculin test is used to detect cows infected with tuberculosis in the dairy herds. The city has authority expressed in its laws and ordinances to remove all cows infected with tuberculosis from its dairy herds. The inspector in charge of the department has been appointed a State live stock inspector under the live stock sanitary laws recently enacted by the legislature of the State, which gives the city increased powers to remove diseased cows from herds supplying milk to the city.

Frequent publications of the results of all tests of milk and the conditions prevailing at the dairies are made through the local newspapers and in this way the public is enabled, in a large measure, to judge for themselves as to the exact condition of each dairy. In fact, the department has enlisted the entire support and co-operation of the local press, the power of which in moulding public opinion is well recognized and appreciated. This publicity not only has the desired effect in aiding in the enforcement of the laws preventing the sale of adulterated and impure milk, thus eliminating the great danger of the morbid effects produced on the health of the citizens, reasonably attributed to the use of such milk, and especially to the younger generation of our race, who have to depend very largely on cow's milk as a nourishment, but it also has the moral effect of deterring the would-be violaters of the laws.

Dairymen are not allowed to fill empty bottles, collected from customers, with milk to be delivered to some other customer, before the bottles have been properly washed and sterilized at the dairies, as bottles may be subjected to infection from a sick room, and in this way it would be an easy matter to carry infectious diseases from one home to another.



BACTERIOLOGICAL LABORATORY, BIRMINGHAM, ALA., MEAT AND MILK INSPECTION DEPARTMENT.

The department sends an inspector out to every dairy where a case of any infectious disease is known to exist in a family connected therewith, to see that proper care is being observed to prevent the infection of the milk supply from such a dairy.

The city exercises the same authority over the quality of milk served in hotels and lunch rooms as that supplied by the dairies. It has been the policy of the department to conduct the work strictly on a scientific basis and to enforce the laws systematically, irrespective of persons or influence. The work of the department is strongly indorsed by the local medical fraternity and by the public generally.

Bacteriological Work

How well the city administration appreciates the work of the department in the interest of public health is in a large measure shown by the fact that the department was given an appropriation last year sufficient for purchasing apparatus and supplies for a complete bacteriological laboratory. With an up-to-date laboratory the department is thus enabled to take on new life and to increase the scope and usefulness of its work materially.

Our milk inspection ordinance requires that no milk shall be sold in the city containing over 500,000 bacteria per cubic centimeter. With the aid of the new laboratory we propose to enforce this part of the inspection ordinance also. The work in this line is now being conducted in a systematic manner, the best methods being brought into service.

The laboratory is supplied with electrical centrifuges and milk-testing apparatus for making detailed analyses of milk. It does all of the microscopic work for physicians throughout the city in making diagnoses for the various diseases possible of detection by this method. The culture tubes and other apparatus for collecting the specimens are supplied by the laboratory. Any physician in the city limits can have done, free of charge, any bacteriological work he may wish. The city deems it a paying investment to do all bacteriological work at its expense in the diagnosis of infectious and contagious diseases, so as to detect the same, as nearly as possible, in their incipiency, in order that the quarantine laws may be successfully and satisfactorily carried out.

A second microscopic test is made, on application, of a culture from all diphtheria cases after the patients have received the antitoxin and have reached the convalescent period, to prove either the presence or absence of the diphtheria bacilli, before the patient is released from isolation. The laboratory is also equipped and prepared for doing pathological work: differential blood counts, uranalysis and various other clinical tests.

The department is making a detailed bacteriological investigation of the public and private water supplies of the city, and is of service to the health department in making a microscopic test of all rooms that are fumigated in cases of infectious diseases, to determine the thoroughness of the fumigation.

LABORATORY, BIRMINGHAM, ALA., MEAT AND MILK INSPECTION DEPARTMENT

MUNICIPAL BOND SALES

Data Concerning Sales of Municipal Bonds During March by Cities of Less than 100,000 Population—Financial Statistics of Cities Listed

Believing that such information as is contained in the following table is of interest and value to Mayors, Comptrollers and other city officials, it is the intention of the MUNICIPAL JOURNAL AND ENGINEER to publish, in the first issue of each month, similar data covering the successive months

NAME OF CITY	Estimated Population	ACTUAL VALUE OF ASSESSABLE PROPERTY (estimated) Total	Per Capita	Ratio of ass'd to actu'l v'lue	Bonded Debt	Sinking Fund	NET BONDED DEBT Total	Per Capita	Tax Rate per $1,000 Ass'd Value	BOND SALES, MARCH, 1907 Term of Years	Amount	Interest	Price	Basis
Pine Bluff, Ark.										3½ avg	$13,000	6%	Par.	
St. Petersburg, Fla.										20–30	63,000	6% s.a.	105.00	5.508
Douglas, Ga.	3,000	$1,500,000	$500.00	67%	$42,000		$42,000	$14.00	$8.50	29⅔ avg.	17,500	5%	101.622	4.867
Hawkinsville, Ga.	3,058	1,500,000	490.52	2/3	46,000		46,000	15.04	11.00	29	15,000	5% s.a.	103.333	4.786
Sandersville, Ga.										15 avg.	30,000	5% s.a.	103.51	4.671
Batesville, Ind.	2,000	2,750,000	1,375.00	1/4	10,000	587	9,413	4.71	12.90	18	3,000	4%	105.20	3.605
Bloomington, Ind.										1–10 ser.	32,000	4%	101.875	3.621
Fort Wayne, Ind.	55,000				604,800	51,782	553,018	10.05	23.40	1–5 ser.	25,000	3½%	Par.	
Wynnewood, I. T.	3,000	1,250,000	416.67	1/2	43,000		43,000	14.33	20.00	20	8,000	5% s.a.	Par.	
Woodward, Ia.											15,000	5%	100.80	
Latonia, Ky.	5,000	5,000,000	1,000.00	2/5	15,000	7,000	8,000	1.60	12.50	1–10 ser.	3,900	6%	104.474	5.058
Bath, Me.										30	20,000	4%	100,54	3.96
Westbrook, Me.	8,500	4,328,922	509.28	1	120,500		120,500	14.18	19.50	15	15,000	4%	100.14	3.987
New Bedford, Mass.										5½ avg.	233,000	4%	Par.	
Peabody, Mass.										1-30 ser.	150,000	4%	100.78	3.932
Holly, Mich.										8½ avg.	15,000	5% s.a.	102.66	4.609
Dawson, Minn.										20	28,000	5% s.a.	103.034	4.763
Hillman, Minn.											3,000	4%	Par.	
Montevideo, Minn.											7,000	4%	Par.	
Chillicothe, Mo.	9,000	6,000,000	666.67	1/4	20,000		20,000	2.22	20.00	11 avg.	100,000	5% s.a.	101.035	4.877
Sarcoxie, Mo.										5–20 opt.	10,000	5% s.a.	100.60	4.86
Webster Groves, Mo.	7,000	4,500,000	642.86	1/2	62,000		62,000	8.86		20	35,000	5% s.a.	107.06	4.463
Forsyth, Mont.										10–20 opt.	50,000	5½%	100.50	5.434
Fremont, Neb.										5–20 opt.	25,000	5% s.a.	100.304	4.93
Norfolk, Neb.	4,800	2,500,000	520.83	20%	101,000	9,000	92,000	19.17	26.75	30	40,000	4% s.a.	90.50	4.586
University Place, Neb.	3,000	1,500,000	500.00	1/5	34,000		34,000	11.33	20.00	10–20 opt.	5,000	5%	101.52	4.806
Manchester, N. H.	60,000				1,785,000	510,696	1,274,304	21.24	19.10	20	50,000	4% s.a.	100.916	3.934
Hunter, N. Y.										4–21	18,500	4%	Par.	
Mt. Vernon, N. Y.	30,000	35,560,000	1,185.33	4/5	2,278,300	613	2,277,687	75.90	20.70	3	60,000	5% s.a.	100.427	4.845
										3	33,000	5% s.a.	100.917	4.668
Norwich, N. Y.										6 avg.	7,500	4%	Par.	
										8½ avg.	6,500	4%	102.00	3.723
Perinton, N. Y.	6,000	3,000,000	500.00	1	None.			None.	4.56	1–20 ser.	25,000	4½%	100.07	4.241
Troy, N. Y.	76,000	54,250,172	713.82	1	3,541,679	85,779	3,455,900	45.47	17.66	20	23,197	4% s.a.	100.107	3.992
										7 mos.	100,000	4%	Par.	
Yonkers, N. Y.	68,000	60,019,750	882.64	....	5,018,682	299,600	4,719,082	69.40	24.48½	3 mos.	160,000	4%	Par.	
Asheville, N. C.										30	30,000	5%	103.29	4.792
Concord, N. C.	11,500	5,500,000	478.26	1/2	175,000		175,000	15.22	12.50	30	100,000	5% s.a.	Par.	
Leeds, N. D.										3–18 ser.	8,000	5% s.a.	Par.	
Athens, O.	6,000	5,600,000	933.33	1/4	200,500	13,711	186,789	31.13	40.30	16 avg.	6,000	5% s.a.	112.960	3.903
Bellaire, O.										10	25,000	4½% s.a.	106.60	3.704
Bellevue, O.										1–10 ser.	2,044	5%	105.07	3.964
Bellefontaine, O.	8,000	10,000,000	1,250.00	3/10	322,083		322,083	40.26		1–10 ser.	17,500	4%	100.062	3.987
										10	59,332	4% s.a.	101.11	3.865
Canton, O.	45,000	60,000,000	1,333.33	3/10	306,000		306,000	68.00	32.00	1–5 ser.	13,500	5% s.a.	102.77	4.001
										1–5 ser.	3,000	5% s.a.	102.50	4.106
Glandorf, O.										5¾ avg.	9,000	5% s.a.	102.911	4.419
College Hill, O.										1–10 ser.	1,310	6%	109.84	3.99
Hamilton, O.	30,000	22,000,000	733.33	1/2	1,064,505	54,684	1,009,821	33.66		1–10 ser.	17,861	4½% s.a.	102.338	4.022
										1–10 ser.	10,174	4½% s.a.	102.379	4.014
Middleport, O.	3,800	800,000	210.52	75%	73,000	4,000	69,000	18.16	37.80	5 avg.	4,200	4½% s.a.	101.819	4.098
										1–10 ser.	4,196	4% s.a.	100.60	3.877
Oakley, O.										1–10 ser.	3,491	5% s.a.	103.804	4.217
Napoleon, O.	5,000	3,000,000	600.00	1/3	186,890		186,890	37.38	47.20	1–5 ser.	1,250	5% s.a.	101.68	4.396
										5½ avg.	43,000	4% s.a.		
										6 avg.	8,500	4% s.a.		
Painesville, O.	5,500	8,000,000	1,454.54	1/3	263,643	35,897	227,746	41.41	29.00	13½ avg.	6,500	4% s.a.	100.053	3.992
										7½ avg.	11,000	4% s.a.		
										1–5 ser.	2,500	4% s.a.		
Piqua, O.	15,000	12,000,000	800.00	1/2		30,000			33.80	10	30,000	4% s.a.	101.11	3.865
Port Clinton, O.										1–10 ser.	8,200	5% s.a.	102.50	4.481
Ravenna, O.										5 5/6 avg.	10,000	4% s.a.	101.00	3.804
Salem, O.	10,000	6,500,000	650.00	1/2	357,000	18,000	339,000	33.90	36.20	1–17 ser.	17,000	4½% s.a.	104.03	3.963
Springfield, O.	48,000	35,000,000	729.17	3/5	1,014,827		1,014,827	21.14	27.30	10½ avg.	35,000	4% s.a.	103.142	3.771
Stryker, O.										16½	1,500	4½% s.a.	104.066	4.151
Tiffin, O.	12,000	10,500,000	875.00	2/5	504,700	12,500	492,200	41.02	24.00	15	19,000	4% s.a.	101.315	3.883
Union City, O.										5	2,500	5½% s.a.	104.96	4.381
Willoughby, O.	2,000	2,000,000	1,000.00	45%	78,000	2,400	75,600	37.80	2.80	5¾ avg.	26,000	4½%	102.087	4.088
Wyoming, O.										1–10 ser.	3,772	5% s.a.	104.902	3.997
Youngstown, O.	60,483	56,882,000	940.45	1/2	1,269,112	209,167	1,059,945	17.52	29.42	6½ avg.	58,000	5% s.a.	105.53	4.024
										3½ avg.	6,380	5% s.a.	102.64	4.181
Mangum, Okla.	3,500	2,500,000	714.28	30%	55,000	2,750	52,250	14.93	5.00	20	15,000	6%	104.33	5.74
Pawhuska, Okla.										20	12,000	6% s.a.	104.47	5.728
Stroud, Okla.										10–30 opt.	10,000	6% s.a.	102.15	5.717
Ione, Ore.										20–30 opt.	4,000	6% s.a.	Par.	
Ambridge, Pa.										12½ avg.	20,000	4% s.a.	Par.	
										25½ avg.	65,000	4½% s.a.		
Duquesne, Pa.	12,000	10,000,000	833.33	1/2	240,000		240,000	20.00	8.00	15½ avg.	20,000	4½% s.a.	103.274	4.263
										5½ avg.	10,000	4½% s.a.		
Lancaster, Pa.	48,000				784,500		784,500	16.34	15.50	26½ avg.	60,000	4% s.a.	100.354	3.974
Scottdale, Pa.										18⅔ avg.	30,000	5% s.a.	104.28	4.654
Spring Forge, Pa.										10–30 opt.	2,500	4%	102.875	3.654
Caldwell, Tex.	2,500	1,250,000	500.00	1/2	20,000	3,500	16,500	6.60	10.00	40	4,000	4%	Par.	
Cleburne, Tex.										22 5/6	32,000	5%	Par.	
Manchester, Va.										34	15,000	5% s.a.	Par.	
Warrenton, Va.	2,000	1,000,000	500.00	1/2	50,000		50,000	25.00	15.00	20–30 opt.	25,000	5% s.a.	Par.	
Sutton, W. Va.										10–30 opt.	18,000	5%	101.00	4.872
East Troy, Wis.										1–20 ser.	10,000	3½% s.a.	101.00	3.38
Hudson, Wis.										20	20,000	3½%	Par.	
Neenah, Wis.	6,048	4,500,000	744.04	3/4	60,000		60,000	9.92		1–20 ser.	50,000	4½%	102.025	4.259
Whitehall, Wis.										1–10 ser.	0,000	5%	Par.	

THE DISPOSAL OF MUNICIPAL WASTE

Systems and Methods, with Special Reference to American Conditions—The Dixon, Davis, Pearce, Decarie and Thackeray Furnaces—Descriptions and Illustrations of Various Makes

By W. F. MORSE, Sanitary Engineer

This Series of articles, begun in the February, 1906, number, will be continued until completed and will be illustrated by original drawings, cuts, diagrams and pictures, and contain many tables valuable for reference.

The Subjects Already Treated by the Author Are:—

1. The Waste Collection Service in American Towns; Methods and Results.
2. Definition of Terms; Quantities; Proportions; Character of Waste in General.
3. Garbage; Analysis; Proportions; Values.
4. Dry Refuse and Rubbish; Quantities and Treatment.
5. Classification:—Commercial Values after Recovery.
6. The Refuse Utilization Stations in New York, Boston, Buffalo, and Brooklyn (illustrated).
7. Municipal Ashes; Analysis; Proportions; Values when Separated.
8. Ashes from Cremation of Garbage; Analysis and Values; Comparative Table.
9. Comparison of Ashes from English and American Cities; Cremation Means.
10. The Utilization of Municipal Waste in General; English and American Methods.
11. Commercial Values of Refuse and Ashes when Marketed and Manufactured.
12. The Analysis of Garbage; Tankage, Its Value (Special Tables).
13. The Garbage Disposal Plant, Cleveland, Ohio.
14. Street Sweepings; Fertilizing Value and Treatment.
15. Comparative Commercial Values of Waste.
16. Foreign Destructors; Special Chapter by an Eminent Authority.
17. The first Garbage Cremators.
18. Official Reports on Crematorn.
19. Chronological List of American Crematories from 1885.
20. List of Government and Institutional Installations.
21. Consolidated Tables of Installations; Hygiene and Sanitation.
22. Types of Furnaces; the Operating American Furnaces (fully illustrated). Continued.

The Following Are to Appear:—

23. Calorific Value of Waste as Fuel (comparative table).
24. Reduction and Extraction Process Described and Illustrated; the Earlier and Later Methods.
25. American Methods; Col. Waring and His Successors.
26. Present Situation in This Country; Résumé.
27. Means for Improvement as Suggested by Several Investigators.
28. What May Be Expected of the Future.

The Dixon Sanitary Crematory Company

This organization was formed at Findlay, O., in 1893, to take up the patents of S. W. Dixon (October, 1891, and April, 1894). The officers were: P. B. Morrison, president; C. W. Patterson, treasurer, and C. A. Stockton, secretary. After remodeling the Engle cremator at Findlay the first crematory was built at Elwood, Ind., followed by others at McKeesport, Pa., and Atlanta, Ga. In 1898 the patents and business passed into the hands of a new company at Toledo, O., with D. C. Shaw, president; G. H. Breyman, vice-president, and E. J. Little, secretary and treasurer. In the succeeding years this company secured new patents and built many crematories all over this country, including nine installations for the United States Government and several institutional plants. This was the first company to unite with local corporations for the collection and disposal of all municipal waste, as at Trenton, N. J., and Oakland, Cal.

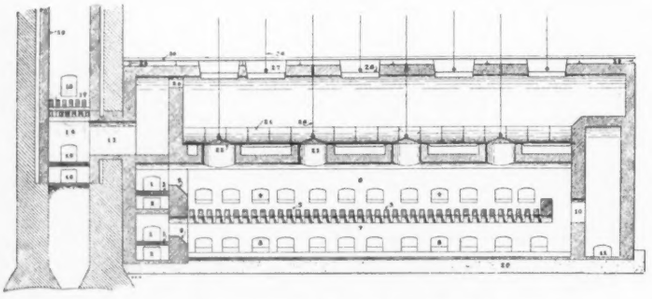


FIG. 42. LONGITUDINAL SECTION. RETURN DRAFT DIXON CREMATORY (1905)

A large share of their success was due to the energy and enterprise of Mr. E. J. Little, who was the active manager. His improvements in furnace construction and methods of collection service were of great value to his company, as also to the general work of waste disposal for municipalities. By reason of the long railroad journeys and the tremendous labor of oversight of contract and construction at widely separated points, Mr. Little died in 1905. He was succeeded by Mr. F. K. Rhines, who for some time had been his chief assistant. Mr. Rhines is now the Secretary and Chief Engineer, the other officers of the company remaining as before.

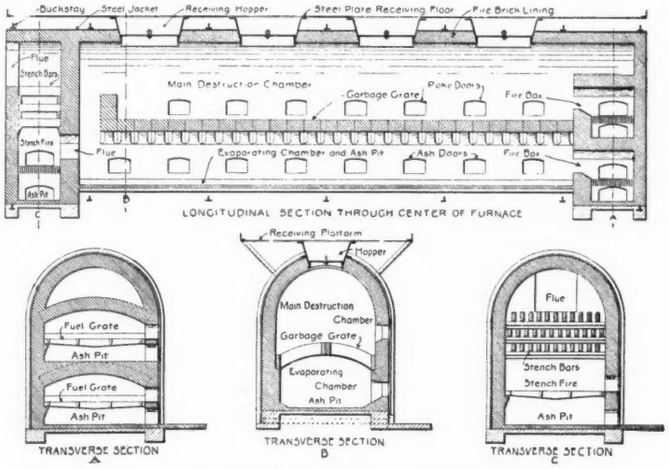


FIG. 43. LONGITUDINAL SECTION. DIRECT DRAFT DIXON CREMATORY (1891)

The Dixon crematory of the earlier form is an elongated rectangular brick structure, enclosing a fire brick chamber divided by horizontal transverse garbage grates into two nearly equal compartments. There is a double fire box at the front end, from which the heat passes over and under the garbage grates, the gases uniting to pass through a flue at the rear end to a combustion chamber fitted with a fire box, and over this a series of staggered fire brick "stench bars," for deodorizing and destroying the products of combustion.

The earlier forms used cast-iron bars for garbage grates, since discarded for a more durable arch of fireclay tile in two sections. This furnace is charged through the openings directly from the carts to the garbage grates with no attempt at preliminary drying. The passage of the flames to the chimney is uninterrupted, except by the stench bars, and this constitutes the "direct draft."

In the later forms the rectangular top is arched and rounded to form a segment of a circle, and the exterior

casing is of steel plate, braced and strengthened by angle bars.

The top charging platform is of steel plate supported on standards bolted to the iron jacket of the furnace. The chimneys are usually of steel, placed on the end of the crematory above the combustion chamber.

The other form of the Dixon crematory has three important changes of the interior construction differing from the direct draft type as shown in Fig. 42.

The purpose of the inventors was "to provide means for drying the garbage, so that itself will serve as fuel for its own combustion, and for the rapid evaporation of water and other fluids, and for feeding to the furnace at such points and in such quantities as may be desired, the dried or partly-dried substances to be consumed."

The crematory is divided into three compartments, the upper one called a drying chamber receives the charge of green garbage from above, and has a series of trap doors with covers operated by chains, through which it is passed to the destruction chamber below. When partially or completely burned, it passes to the third or lower evaporating chamber, from which the ashes are withdrawn. The liquids pass to the lower compartment.

The fuel boxes are at the chimney or rear end, the heat passing under the floor of the destruction chamber, and through this, or above through the drying chamber, as may be desired.

The same arrangement of secondary fire and stench bars in the combustion chamber of the stack is continued, or this may be replaced by a series of horizontal fire-clay tubes, heated from below by the primary fire box, in which the gases of combustion are finally destroyed.

This combination of three chambers, for different purposes, with the necessary doors and dampers, is somewhat complicated, and needs attention to secure good results.

This "return draft" furnace is used mostly for the smaller installations, and employed but three times in municipal work.

As stated by the manager of the Dixon company: "In all forms of crematories built under the 'Dixon' name, there is manifest a desire to adhere to the simplicity of principles which was the key to the success of the original invention."

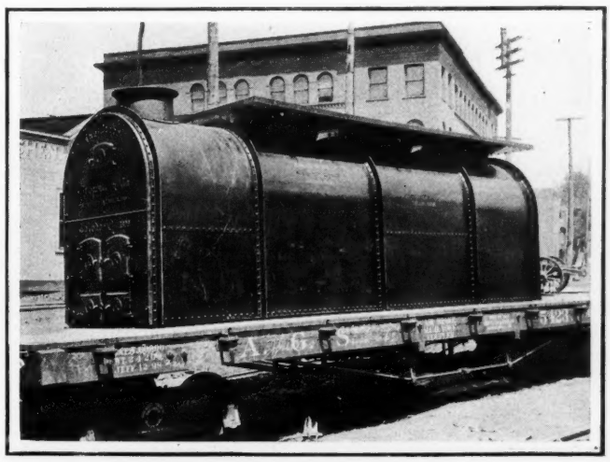


FIG. 44. EXTERIOR CASING DIXON CREMATORY

The work of this company has extended all over this country, and the largest number of operating disposal plants stands to its credit. There are two Dixon crematories in South America, and a small furnace was built in Cuba during the Spanish-American war.

The company was awarded the Grand Prize for its work at the World's Fair, St. Louis, in 1904, and the Dixon crematory has been selected for installation at the Jamestown Exposition at Norfolk, 1907.

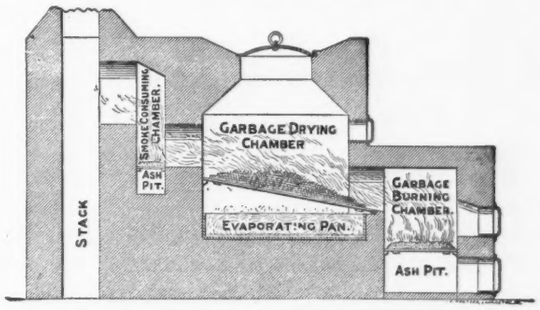


FIG. 45. LONGITUDINAL SECTION DAVIS GARBAGE FURNACE

The Davis Garbage Furnace Company

The Davis Garbage Furnace was the invention of Dr. M. L. Davis, Lancaster, Pa., October, 1891. The first installation was at Lancaster, 1891, followed by furnaces at Reading, Pa., and Trenton, 1899. The Reading furnace was discontinued in 1899. Others were built at Oil City and Coudersport, Pa., and for the United States Government at Havana, now discontinued. The Trenton furnace is the best known one of this company, and was reported upon by Mr. Rudolph Hering (MUNICIPAL JOURNAL, November 7, 1906).

The Davis furnace as described by Mr. John H. Hook, secretary of the company, is composed of three separate compartments or chambers.

The Primary fire chamber for fuel to begin the work, afterwards for the garbage dried upon the grates of the drying chamber.

The Garbage drying chamber, which is charged from above through a circular opening in the roof, and which is floored by a movable iron grate which may be raised, or inclined toward the primary fire box for dumping the dried charge when desired.

Beneath this inclined grate is an iron evaporating pan, which receives the liquids from the garbage above. The evaporated vapors pass through the grate, and, with the products of combustion of the garbage, pass through a short flue into the third division.

The smoke consuming chamber is at a higher level, and so arranged with a fuel box and ash pit below that the smoke and gases of combustion must pass completely over this fire to reach the flue connecting with the stack.

The furnace is a large cell with a capacity of about eight tons per day, and two or more may be built in battery connected with a chimney in common.

The patentee, Dr. M. L. Davis, has made several useful inventions in the line of sanitary work, the Davis cremation furnace and the Davis Hospital for Contagious Diseases being among those best known.

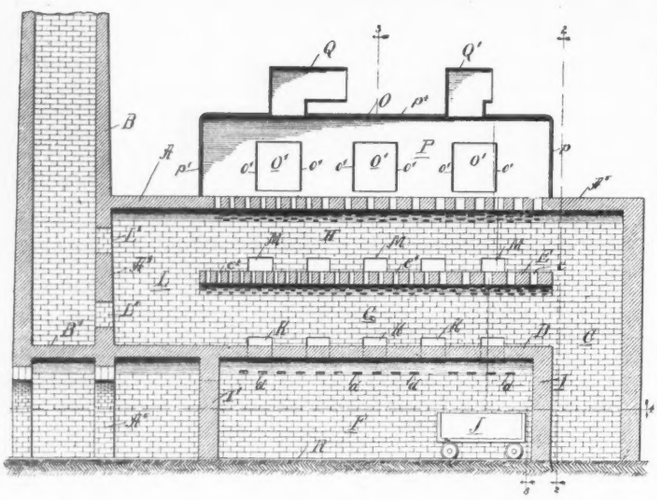


FIG. 46. LONGITUDINAL SECTION PEARCE GARBAGE FURNACE (1900)

Pearce Garbage Furnace Company

The garbage furnace of E. DeLa Chapelle and John Pearce was first built for experimental purposes at Ottawa, Ill., about 1897, but after trial this furnace was discontinued.

The second installation was at Evanston, Ill., in 1900, and continued in use three years, when a contract was made for the disposal of the garbage by other means.

The installation at Flushing, N. Y., in 1905 is now operating. Another furnace at Rockaway, N. Y., was completed in 1906, and operated successfully for some months, but was suspended pending the issue of proceedings concerning its location upon ground claimed to be in violation of a previous order of the court. This litigation is still pending.

The inventors claim "an improved furnace provided in addition to the combustion space within which the garbage is burned, with a closed garbage-drying chamber which is provided with eduction flues, by means of which the gases and vapors evolved during the drying of garbage are conducted to the interior of the furnace."

The furnace is a plain rectangular brick structure similar to others of the American type of crematories, but of unusual height to provide room for the upper drying chamber (P) and the two sets of horizontal arched garbage grates (A-E) below. These grates are provided with openings, through which the dried charge passes to the lower closed arch or hearth (D), which has small side openings beneath for removal of the ashes into cars below.

The furnace may employ any available fuel, but, as shown in Fig. 46, is arranged for natural gas supplied to the fire box (C). In other cases the fuel box is supplied with coal burned on fire bars in the usual manner. The air for combustion is drawn from the drying chamber (P) by the chimney draft through the eduction tubes (q) and brought under the fire bars, highly heated, as an aid to combustion.

The gases pass through the openings (L) to the chimney. The particular advantages claimed are the housing in of the upper drying chamber, which receives the charges of green garbage through the doors (q^1), the rapid drying out of the moisture, which reduces the bulk and permits the passage of the dried charge through the highly heated grates to the lower chamber, whence it is removed thoroughly burned.

The furnace may be built in all sizes for any location and consume any fuel. The installations at Flushing and Rockaway were built by Mr. James Nolan, of Brooklyn, and are the only ones now in use.

The Decarie Manufacturing Company

The Decarie Incinerator was the invention of Mr. F. L. Decarie, of Montreal, Canada, in 1897. The original invention, described in U. S. Patent No. 596,421, was probably the most complicated apparatus yet devised for the destruction of municipal waste. There is no record of this ever having been used in the original form. About June, 1901, Mr. Decarie applied for another patent which was issued January 12, 1904, No. 749,269. This is the basis of the present form of this incinerator, though many changes are made in the latest constructions.

Two forms of furnaces were included in this patent, alike in exterior dimensions but differing in interior details. The first is an incinerating chamber, with interior length about twice its width and height. These exterior walls are of brick built and stayed in the usual manner. The floor of this chamber is a series of heavy fire-grates, supported on bearing bars, with an ash-pit beneath, the bottom of which is a shallow double-jacketed iron pan, holding water.

The walls of the incinerating chamber support a shallow rectangular iron box or "steam generator," covering all the roof of the chamber. Above this box is another of a larger capacity, also of iron, and provided on the top with four charging ports, with covers. One large charging hole extends through the drying chamber and the steam generator to the incinerating chamber below; the others do not connect with the incinerating chamber, but discharge into the drying chamber only. This generator is made after the usual boiler construction, with a multiplicity of stay-bolts and provided with pipes for steam and water supply. The garbage grates are a series of hollow pipes connected at their upper ends by screw-threaded

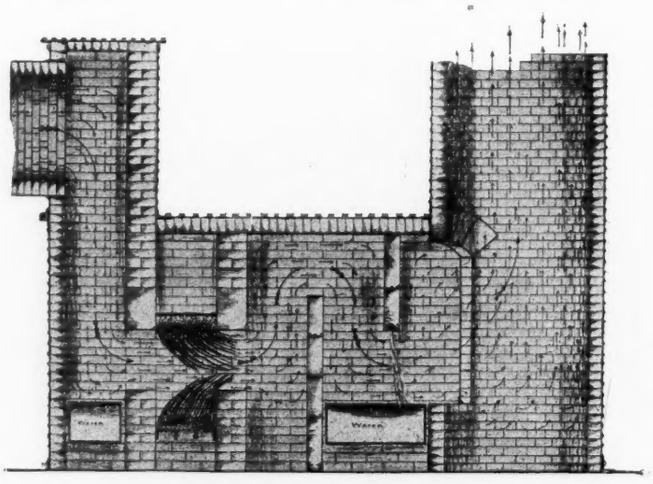


FIG. 47. "FUME CREMATOR" DECARIE INCINERATOR (1904)

joints tapped into the bottom plate of the generator. The grates describe a curve or incline to the middle of the lower part of the incinerating chamber, where they are connected with one large header, just above the fire bars. These grates form a basket to hold the garbage charged through the generator, but are placed on the sides. On circulating system, which includes the steam generator, the water grates, the headers, and the double steel outer water-jacket, which is sometimes used instead of the brick walls. The purpose of this water system being to preserve the iron parts from destruction by the heat from the fires below. In some constructions the roof of the furnace is of fire-brick, and the generator is replaced by two large headers at the upper corners of the chamber.

In the other form described in the patent, the brick construction for the exterior walls is replaced by a double steel casing, secured by many hundreds of stay-bolts and connected with the water circulating system.

The latest form of construction is shown by Fig. 48, and is similar in exterior dimensions to those previously noted, with some interior changes. Here the steam generator is made deeper and occupies all the space above the incinerating chamber, leaving out the drying chamber altogether. The charging holes on top extend completely through the generator, but are placed on the sides. On the outside of the sides and ends are smaller charging chutes, for very wet material, the liquids from which are conducted to the evaporating pan under the ash-pit.

The garbage grates are inclined from the middle line of the steam generator, where their upper ends are tapped into the bottom sheet, to the headers along the sides of the chamber. There is a union or connection in these pipes and a short level section of piping just before the connection with the headers.

These grates, inclined from the middle of the generator to the furnace walls, from a basket of iron pipes, enclosing a triangular space, which receives the garbage charged through the holes above. All the parts that will admit of it are of hollow iron spaces with water circulation, somewhat resembling a magnified locomotive steam boiler. The partially dried garbage which is confined within the suspending basket, may be mechanically stoked down into the fires below by bars thrust through the stoke-holes in the walls of the furnace at various points. To reach the inner surfaces of the basket the rakes must be thrust through doors on the opposite sides of the furnace, or through the larger doors at the front and rear ends. There are upwards of forty doors and openings of various sizes in each incinerator and fume cremator of 50 tons capacity.

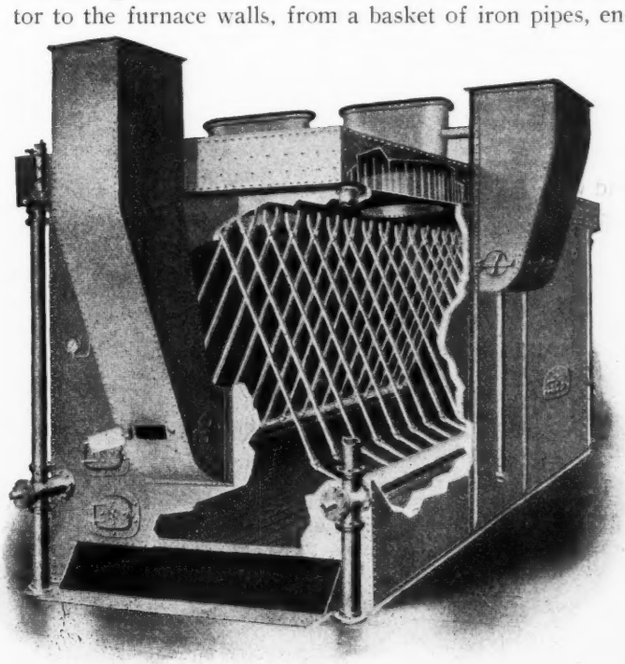


FIG. 48. LONGITUDINAL INTERIOR SECTION DECARIE INCINERATOR (1904)

To consume the gases and products of combustion there is, in the latest forms, a "fume cremator" (Fig. 47), placed between the incinerator and the chimney. This is a separate brick chamber enclosed in steel plate with many doors for removal of ashes, supply of fuel and water. The gases from the incinerator first pass through a perforated brick partition, then into a descending flue floored with a water tank, then between two fuel boxes, are then deflected upwards by the bridge well and downward by the hanging wall, passing over the surface of the two water tanks and through the curtain, or scrubber, of water from the perforated pipes to the chimney. This complicated arrangement of walls and water tanks is necessary to arrest the flying particles of paper and dust, and to reheat and reburn the carbon in the smoke and gases of the combustion products from the incinerator.

The chief elements of this furnace include five separate features which have been successively tried and rejected by other furnace builders in England and America. These are the inclined arrangement of iron grates, first used by the U. S. Government crematory at Governor's Island, N. Y., 1885; the double exterior water-jacket of plate steel used by S. G. Brown, of Boston, at Wilmington, Del., 1894; the hollow water grates, used first in England, afterwards at Jacksonville, Savannah and Richmond in 1891-4. This same water pipe construction was used by the Bridgeport Iron Works at their garbage furnace at Newport News, 1894, which was not accepted by the city.

The steam generator placed over the fire-box at a distance of about eight feet is a construction first employed in England by several companies, most of which have now entirely discontinued its use. The "fume cremator," or separate furnace for destruction of gases, was invented by Chas. Jones of Ealing, England, in 1887-8, and was used by several builders for ten or twelve years, but is no longer employed by them.

This incinerator is a radical departure from the usual type of American cremators and garbage furnaces previously described and stands in a class by itself. The principles of its operation appear to be the reception of large amounts of wastes at one time, the slow and incomplete combustion of these by a fire placed below and between the grates, the absence of any radiated heat from the water jacket walls,

roof, and garbage grates of the interior, and the reburning in a secondary separate furnace of the smoke and gases evolved from the incompleted combustion of the primary fire. The question of temperatures developed and maintained in the several parts of this incinerator will be considered later in connection with other garbage cremating furnaces.

The first company formed under the title of the Decarie Incinerating Company assigned its business in 1903 to the Decarie Manufacturing Company of Minneapolis, a corporation under the laws of Minnesota.

The first incinerator built at Westmont, Canada, has not been operated since the six first months of its trial. An installation at New York City was abandoned after three months, the city cancelling the contract because of unsatisfactory working. The incinerator at Minneapolis has been operated for about four years. After having been twice burned, it is now being rebuilt at a cost of $17,000. The incinerator at Tampa, Fla. (1904) was replaced by a large crematory built by another company in 1906-1907. The large installation at Los Angeles was damaged by fire in 1906 and is reported as not now in operation. There are three small incinerators at Johnstown, Pa., Ocean Beach and Santa Monica, Cal., each of ten to fifteen tons' capacity—for garbage and refuse. Two small refuse incinerators were built at Brooklyn and Lowell, that do not destroy garbage, animals or night-soil. Four plants at Sacramento, Winnipeg, Edmonton and Zanesville are under contract, but not yet built. The five incinerators at Atlanta, Los Angeles, Duluth, Spokane and Muncie are the only large municipal installations now operating.

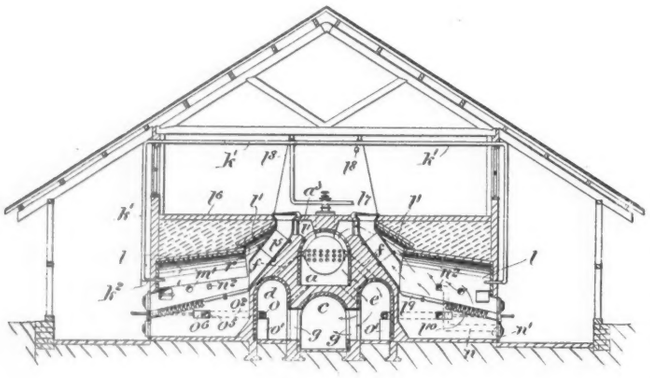


FIG. 49. CROSS SECTION THACKERAY INCINERATOR (1894)

The Thackeray Incinerator Company

The garbage and refuse furnace built at Montreal by Mr. Chas. Thackeray in 1894 was the first departure from the popular form of American crematory. He took the "Fryer" destructor as his model in all the essential points, except that each cell or furnace was made independent of the others, and placed back to back to form a battery or series of cells having a common charging platform on top. (Fig. 49).

Each cell is charged from the top, the garbage falling on a short, sharply-inclined hearth of fire-brick (f) just above the fire bars. These inclined fire grates are two sections, the upper ones stationary (a), the lower ones are rocking grates, by the motion of which the refuse is gradually moved forward and the clinkers deposited on the dead plate are removed through the doors.

The gases and products of combustion pass through side flies into passages between the cells and back and downward to the smaller longitudinal flue (e), which at the end discharge into the main central flue (c) to the chimney. There was at first a steam boiler set in this central flue, as shown in the figure, but as this obstructed the draft, and did not develop steam sufficient to furnish a forced draft or moving the rocking grates, it was removed.

The furnaces are operated by natural draft, the chimney being 180 feet high. Additional details of cost of construction and operating expenses are reported in this journal for November, 1906.

(To be continued)

New Fire Extinguishing Device

WILLIAM T. BELT, Chief Engineer of the Fire Department of Washington, D. C., on April 9 made a formal test of a new device known as the Sieber Chemical Fire Nozzle. The test was made in competition with a 160-gallon chemical engine belonging to the department, the inventor, Mr. Henry Sieben, claiming that this nozzle would extinguish a large fire very much more quickly than could be done with a chemical engine. In his report to the Commissioners, Chief Belt says:

"The Sieben device consists of a hollow nozzle, in which is inserted a perforated cartridge filled with a combination of oxalic acid and bicarbonate of soda in powdered form. The nozzle is connected to a fifty-foot section of one-inch rubber hose and attached to a fire hydrant. On the occasion of this test the fire hydrant registered a pressure of forty-five pounds. The water passing through the cartridge and nozzle generates gases similar to those generated in chemical engines and fire extinguishers by the use of sulphuric acid and bicarbonate of soda.

"Two frame houses were built, each sixteen feet high, fifteen feet long and eight feet wide, with a division in the center forming a floor and making the houses two stories in height. In each of these houses was placed thirty-six shoe boxes, one wagon load of wooden strips, one bale of hay, and ten gallons of kerosene oil.

"At twenty-six minutes past 2 o'clock I gave the order to set these houses on fire. Two men were detailed for the purpose and the houses were fired simultaneously. When I saw that the houses were thoroughly ignited I gave orders for the fires to be extinguished. Both parties started together, I using a stop watch and timing the Sieben nozzle, while Mr. J. R. Young, the representative of the *Evening Star,* with a stop watch, timed the chemical engine.

"Mr. Sieben extinguished his fire in forty seconds; in fact, the very minute the stream was turned on the fire black spots commenced to show. It took the fireman detailed with the chemical engine five minutes to extinguish his fire. The test was perfectly fair and satisfactory to all present.

"In order to determine whether or not the acid generated by the Sieben nozzle would destroy or injure delicate fabrics, I collected a quart of the liquid as it came from the nozzle and with it wet a small piece of litmus paper. The paper remained uninjured and unchanged. Mr. Sieben then took a handful of the two ingredients which are used in the cartridges and with water washed his hands and allowed them to dry without wiping. The material semed to have no injurious effect whatever.

"This report is merely a statement of facts and conditions as I found them and is not to be regarded as a recommendation of the Sieben Chemical Fire Nozzle."

NEWS OF THE MUNICIPALITIES

Divers Subjects of General Interest and Their Treatment by City Councils and Officials—Streets, Waterworks, Lighting and Sanitary Matters—Police and Fire Items—Government and Finance

Roads and Pavements

DETROIT, MICH.—The Committee on Streets has issued a report sustaining Mayor Thompson's veto of the sidewalk contracts and has reported in favor of the day labor system of constructing walks. In the course of investigation it was found that all walks, without a single exception, constructed by day labor were in excellent condition, while some of the walks built by contractors were not built according to specifications and many of them required repairs. It was recommended that so far as possible walks be laid by day labor and that contracts be let at intervals if it appeared that the city forces could not keep up with the work.

HAVANA, CUBA.—Plans for the expenditure of $4,500,000 for the construction of roads throughout the island during the coming year have been approved by Governor Magoon. This is part of a plan prepared by Colonel Black, formerly Engineer Commissioner of the District of Columbia, which involves a total expenditure of $13,000,000.

HUNTSVILLE, ALA.—The paving of the Public Square, for many years the dream of the progressive element in the city, seems now about to be realized. A paving ordinance has been passed under the new State law by which the expense is assessed against the abutting property owners. Vitrified brick will be the material used and the total cost will be about $14,000. To do this work no extra general taxation will be necessary; in fact, all property owners not owning property abutting on the square will be relieved of one quarter of their city taxes.

IOWA CITY, IA.—A change in the method of selecting the kind of paving to be used on a street is advocated by men interested in public affairs, on account of a recent paving decision permitting patented paving material to be used even where there can be but one bidder. At present the Council passes a resolution declaring that it is necessary to pave a street, the property owners by petition select the kind of material to be used, and then call for bids. It is proposed to amend the procedure so that bids may be received on various kinds of pavement for a street and, with the prices before them, the property owners may then select the kind of material they desire.

MOLINE, ILL.—During the year 1906, 24,457 square yards of asphalt and 31,204 square yards of brick paving were laid, at a total cost of $121,130, including the curbing.

SCRANTON, PA.—A plan for paving all the unimproved streets of the city, ninety miles in all, has been presented by Mayor Dimmick to the City Council. The question of a bond issue of a million dollars will first have to be submitted to popular vote. This sum would provide the unpaved portion of the city with a 28-foot roadway of macadam, estimated at 48 cents for limestone and 53 for trap rock. The use of macadam, however, is not compulsory. If the property owners of a street express a preference for a more permanent kind of paving, they may so decide and the sum of 50 cents per yard will be credited to their paving assessments. In making the estimates of cost, figures derived from experience in building State highways were depended on. City conditions, with higher labor charges and shorter hauls, might bring about different results.

Sewage and Sanitation

ALBANY, N. Y.—A petition signed by 60 taxpayers and riparian owners along the upper Hudson river has been filed with Governor Hughes. The complaint is based on facts ascertained by the Merchants' Association of New York in regard to the pollution of the river by paper mills at Glens Falls, Fort Edward, Palmer's Falls, Sandy Hill and Hadley, as well as the sewage of Glens Falls, Sandy Hill and Fort Edward. The inhabitants of Troy drink this water. The death rate there is 24.9 per 100,000, the sixth highest of the cities of the State.

AUGUSTA, ME.—According to the annual report of Street Engineer William B. Getchell, there were constructed during the past year 2,714 feet of pipe sewers. There are now 15 2-3 miles of sewers and drains in the city. Two sewers which emptied into the flats above low water mark were lengthened with iron pipe provided with an outlet manhole.

BALTIMORE, MD.—That the sewers being laid out are too large and that a million dollars could be saved on the sewer system by making them smaller was the claim made in a letter to the Sewerage Commission by Water Engineer Alfred M. Quick. Mr. Quick declared that his investigations led him to conclude that the sewage of Baltimore city amounts to not more than 60 gallons per capita each day, and that, therefore, in building sewers to accommodate 150 gallons per capita a day the Commission is building sewers that are altogether too large. The extra cost of these large sewers should be saved, Mr. Quick contends. In reply to these assertions, the Commission's consulting experts, Messrs. Gray, Hering and Stearns, say that it is best to be guided by the experience of other cities rather than by apparent local conditions, and that accordingly the sewers should not be made any smaller. The Commissioners approved the advice of experts and will carry out existing plans.

EAST RUTHERFORD, N. J.—At a public meeting, presided over by Mayor William Gramlich, a report on the sewage question was received from a special committee. The report, which was adopted, recommends that the system be constructed independent of that of any other municipality. A system delivering into septic tanks is recommended for the east end of the borough. The west end system will be so constructed that it may deliver into the Passaic river for the present.

GLEN HAVEN, N. Y.—A sewerage system for a sanitarium is being built by the city of Syracuse for the purpose of protecting its water supply. Not satisfied with the contractor's bid of $3,200, Commissioner of Public Works Thompson has done the work by day's labor at a cost of $1,600. A septic tank still has to be built, the overflow from which will be turned into the ground.

NEWARK, N. J.—Some time ago the Common Council passed an anti-smoke ordinance and in accordance with its terms a Smoke Inspector was appointed. After a few weeks' investigation of the field the inspector has resigned, having come to the conclusion that it was impossible under the ordinance to secure any convictions for violation. The law department is looking into the matter and probably will recommend the passage of an ordinance similar to that in force in Atlantic City.

NEW YORK, N. Y.—At the end of its first year of active work in aiding to suppress one of the nuisances in New

York, the Anti-Smoke League reports that 132 convictions were obtained during 1906 for violations of the smoke ordinance. In the two preceding years no convictions were obtained. Officials of the Health Department, acting under the League's requests, made 193 arrests during 1906. Of this total 132 defendants were convicted, 36 were discharged and 25 cases still are pending.

Pensacola, Fla.—As a sequence of the abandonment of his sewage contract by R. C. Storrie, the Board of Trustees has passed resolutions notifying the bondsmen, the American Surety Company, of New York, to complete the work. Ten days will be given the surety company to state what action it intends to take. In the event of the failure of the company to act, the resolution provides that the work may be continued either by day's labor or by contract.

Sacramento, Cal.—An explanation of the use to which the proposed bond issue of $200,000 for sewers will be put, has been made by City Engineer George Randle. About six years ago a plan for a sewerage system was made by Rudolph Hering. Part of this system was built. Now it is proposed to extend the system over the same area as contemplated in the original plan, but there will be some changes in the location of many sewers. It is now proposed to use egg-shaped instead of circular sewers originally planned. Flush gates will be used, as the grades are necessarily flat.

Springfield, O.—The importance of a good sewerage system in its relation to the public health was explained in a lecture under the auspices of the Commercial Club by Mr. E. G. Bradbury, of Columbus. The lecture was illustrated by lantern slides of a number of disposal plants, among them those of Saratoga, N. Y., Providence, R. I.; the Massillon, O., State Hospital; the Lancaster, O., Reform School, and the Soldiers' and Sailors' Orphans' Home at Sandusky, O. During the lecture some plates prepared by City Engineer W. H. Sieverling, illustrating plans about to be carried out in Springfield, were thrown on the screen.

Sumter, S. C.—It seems probable that the $50,000 sewerage bonds recently voted will not be sold, as the city has sufficient money on hand. A drainage canal is now being constructed without cost to the city, as the work is being done by the County chain gang in payment for work of convicts sent to the gang from the Recorder's court during the last year. This canal will be four miles long and is 15 feet wide at the top and 10 feet at the bottom.

Syracuse, N. Y.—The bill providing for the intercepting sewer system for Syracuse has been signed by Governor Hughes. The bill provides for a bond issue of $500,000, and the creation of a Commission to have charge of the work. The city could, it is believed, carry out the project without legislative authority, but legislation was desired, as it will be necessary to secure right-of-way along Onondaga creek, across property valuable for business purposes. A question has also been raised as to the method of assessment. As now arranged, the cost will rest on the city at large.

Vacaville, Cal.—The much desired and long delayed sewer system is about to be installed. Half of the terra-cotta pipe needed has already arrived in the city. The Trustees still have to secure the right-of-way to a sewer farm to be established northeast of the city. Part of the way the sewer will extend along the railroad right-of-way and in low places will be carried on a trestle.

York, Pa.—A modification of the original plans for sewage disposal which will effect a saving of $300,000 has been devised by City Engineer Robert McKinnon and reported to a committee of the Municipal League which is studying the subject. To a point four miles below the city where it is proposed to discharge into a creek is a fall of 21 feet, allowing five feet for depth of the sewer. Mr. McKinnon estimates shallow filter beds may be constructed. This plan would include the building of a dyke along the creek to a height which would protect the beds from a 10-foot flood.

Waterworks

East Orange, N. J.—After considering a report presented by State Forester Gaskill, the Water Committee of the East Orange City Council has decided to make an arrangement with the State Board of Forestry for the care of forestry work on the grounds of the municipal water plant in Millburn. The property consists of 900 acres. The plan is to cut out old wood and sell it. With this revenue plantations will be made. The kind of trees will be selected by Mr. Gaskill and will include pine, larch and ash. The city will have to patrol the forests to guard against destruction by fire.

Pekin, Ill.—An estimate of the value of the waterworks has been given to the City Council by Prof. A. N. Talbot. About ten years ago the works might have been purchased for $83,000, at another time the value was placed at $113,000. Now the value is estimated at about $140,000, of which $40,000 is "going value." The items of the plant are: Land and buildings, $13,900; 15 wells and well houses, $4,200; pumping machinery, $9,700; distribution system, $66,600; small pipe distribution system, $7,600; taps and service pipes, $32,000; water tower, $11,100. The income of the plant is $25,750, of which $3,250 is hydrant rental. The cost of operation is not over $10,500, while 5 per cent. interest on $160,000 and $2,000 annually for sinking fund to cover deterioration make the annual expenditures $20,500. The quality of the water is excellent, but there is a possibility of contamination in the future when the limits of the town extend.

Pensacola, Fla.—The city has received a favorable reply to the offer made to purchase the plant of the Pensacola Water Company for the sum of $187,500. As an issue of $250,000 bonds was made for a municipal plant, a good balance will be left for needed extensions of the distributing system.

Schenectady, N. Y.—The burying of a 36-inch water main under a 40-foot embankment of sand by the Delaware and Hudson Railroad in the course of their construction of a new track, was objected to by City Engineer Sebring. An injunction notice had been served, but the fill will be permitted if the railroad will pay the cost of raising the pipe so that it will run only a few feet below the track. The cost of changing the line will amount to $5,000.

Woodbury, N. J.—An artesian well was bored on the Matlock lot as a test for a proposed new supply of water for the city. If the flow is good, and it is understood that the well taps the same vein from which Camden is supplied, more wells will be driven. The city may get the lot as a site for a new water plant.

Street Lighting and Electric Power

Auburn, Ind.—Gas is now being used in the city from a plant half a mile away as well as by the town of Garrett, three miles distant. This was made possible by a recent act of the Legislature giving artificial gas companies the same rights of eminent domain that natural gas companies enjoy.

Bessemer, Ala.—The City Council has granted a franchise to a company to furnish gas to Bessemer under the following conditions: A forfeit of $1,000 to be paid in case the company failed to build the plant within a year;

a rate of $1.50 per thousand feet for five years, after which the price may be readjusted; a free supply of gas for lighting and cooking to the City Hall. In the event of the company wishing to sell the plant, the city is to have the option of buying.

BUFFALO, N. Y.—The recommendation of Mayor J. N. Adam that the city's contract with the Buffalo Gas Light Company be renewed without the Welsbach burners on the street lamps and that the old style of flat-flame burner be substituted, was approved by the Lamp Committee of the Board of Aldermen. The city has been paying $24.50 a year for each Welsbach light. Under the new contract the city will pay 74.99 cents per 1,000 cubic feet.

COLLINSVILLE, CONN.—At a recent town meeting at which Manager Charles G. Bilt, of the Union Light, Heat and Power Company, gave an interesting talk on the details of electric-lighting and the proposal of the company to light the streets of the town, a resolution was passed without a dissenting vote that the town be furnished with sixty 50-candle power lights, most of them to burn until 1 a. m. only. The annual cost of the lighting will be $906.

MINNEAPOLIS, MINN.—The terms of the franchise which the city is prepared to grant the Minneapolis General Electric Company are:

A tentative 30-year agreement or license, reserving the right of the city to purchase the plant at the end of ten years or at a period of each five years thereafter; the right of the city to purchase the company's plant at its appraisement value, without taking into consideration the profits to be computed on the unexpired term of its unexpired franchise or license term; thorough control on the part of the Council of rate fixing; that the company will forfeit franchise or license for breach of contract, authority to rest with Council as to what constitutes the breach; right to use subway conduits to be retained for use on the part of the city; information of account, as to earning, etc., to be communicated to City Council; thoroughly modern street lamps to be furnished by the company; that six months shall be allowed the company, after the passage of the agreement, to fulfill the provisions; that tearing up of paved streets be done under the direction of the City Engineer, who shall oversee repairs, etc., the bill being rendered to the company; that the city Fire and Police Departments shall be supplied with electrical energy free of charge.

NEWARK, N. J.—Frederick G. Runyon, electrical expert and consulting engineer to the Municipal Lighting Committee of the Common Council, has made an extensive report, embodying three propositions. Two of them provide for a turbine plant in the Newark water shed at Oak Ridge, at the Macopin outlet. He recommends the adoption of his third plant. This provides for using the long ago abandoned Belleville waterworks plant as an electric-lighting station. A special election will be held to vote on an issue of $1,000,000 to carry out the plan.

PASADENA, CAL.—Regulations for the installation of electrical wires, apparatus and equipment, have been established by an ordinance which also creates the office of City Electrician. With few exceptions, the rules and regulations of the National Board of Fire Underwriters as embodied in the National Electric Code are adopted. Fees will be charged for inspections, but the electrician will be a salaried officer.

Fire and Police

ALLEGHENY, PA.—According to the report of Superintendent of Police John Glenn, Allegheny has had less crime during the past year than in any period since the adoption of the present city charter. The total value of all property reported as stolen was $8,500, and of this $7,150 was recovered.

BOSTON, MASS.—Boston has steadily improved its fire protection in the last year, according to a report just made by W. H. Jackson, General Inspector of the National Board of Fire Underwriters. Weak parts of the distribution system have been strengthened by installing additional mains. The extension of the meterage system is increasing the supply available in existing mains. The call force of the Fire Department has been decreased and the permanent force increased. All but a few of the fire engines having a tested capacity of less than 500 gallons a minute have been replaced. Only engines having a capacity of 700 gallons are retained in service in the closely built-up sections of the city. Aerial trucks have been provided with quick-raising devices.

CHICAGO, ILL.—Confidence men, pickpockets, and other crooks who heretofore have managed to escape punishment by paying fines, will be required to work on a municipal stone pile under the new vagrancy bill if it is enacted by the Legislature.

NEW YORK, N. Y.—Many of the expected changes in the Police Department occurred when Commissioner Theodore A. Bingham made his first use of his power under the new law by reducing eight Inspectors to Precinct Commanders and detailing seven Captains as Acting Inspectors. Many detectives from the Central Bureau were also sent back to regular duty. All of the plain-clothes men who were on the staff of the Inspectors who were reduced have been remanded to patrol duty. Most of these men have not worn uniforms in years.

Government and Finance

BUFFALO, N. Y.—Mayor J. N. Adam has sent a communication to the Aldermen showing the deficiencies incurred by bad bookkeeping on the part of previous administrations. During the last two years and the present year, $1,250,000 worth of deficiencies will be made up. The Mayor says the city will be helped greatly if it can get a more liberal share of the excise fees. He is also of the opinion that the taxes on local trust companies ought to go to the city, rather than to the State.

PITTSBURG, PA.—Acting under the direction of Mayor George W. Guthrie and Comptroller John B. Larkin, City Auditor F. A. Kimball has just perfected a system of apportioning the appropriations of the city departments and bureaus which, it is believed, will confine all of them within limits and certainly prevent deficits at the end of the fiscal year. In a few days Mr. Kimball will furnish to each department and bureau head a schedule of the expenses he will be allowed to incur during each month. The money to be used by each bureau will not be apportioned into twelve equal parts, but will be divided according to the probabilities of the necessities of each particular case, the probabilities having been ascertained by actual experience. Where any expense is incurred in excess of the monthly allowance the official responsible will be required to give a satisfactory explanation.

PORT JERVIS, N. Y.—A charter being drawn up by a General Charter Committee for the use of the local government on its transition from a town to a city contains fourteen articles, each one dealing with the following subjects:

1. Incorporation, City and boundaries.
2. Clity officers' eligibility; elections, appointments, terms of office, compensation, filling vacancies.
3. City officers; other general powers and duties.
4. The Common Council.
5. Local improvements, streets, highways and bridges, sidewalks and sewers.
6. The assessment and allotting of taxes.
7. The Police Department.
8. Fire Department.
9. Department of Charities.
10. Department of Health.
11. Department of Law.
12. Bonds and certificates of indebtedness of the city.
13. Actions by and against the city.
14. Miscellaneous.

Richmond, Va.—Janitor service for the City Hall is said to cost the city about $9,000 a year. An offer has been made by a business man to enter into a contract to clean the City Hall, furnish brooms, brushes and toilet articles for the sum of $5,500 a year. The janitors are now asking to have their pay raised from $50 to $55 a month, which, if granted, will still further increase the expense.

Wichita, Kan.—The question of issuing bonds to pay for street work is being considered. The assessed valuation of the city is $7,000,000, which is about 30 per cent. of the actual valuation. According to law a city shall not exceed 10 per cent. of its valuation in bond issues for general purposes. If the law refers to assessed valuation, then no more bonds can be issued. This, however, does not prevent localities (improvement districts), by taking the initiative, from issuing special improvement bonds. One street is now being paved under this system. It is also possible for the city to award contracts to individuals who will accept bonds for their work.

Refuse Collection and Disposal

Chicago, Ill.—A proclamation has been issued by Mayor Busse calling upon the people of the city to assist in obtaining better conditions of municipal cleanliness by burning all combustible material and to avoid the littering of streets. Moreover, all residents are requested to set aside May 6 as a general outdoor cleaning day. Citizens are also requested to familiarize themselves with the provisions of the street cleaning ordinance.

Grand Rapids, Mich.—Arbor day will be combined with a municipal cleaning day, in accordance with a proclamation of Mayor Ellis. It has been decided to issue a leaflet to the pupils in all schools containing suggestions as to what should be done on that day.

Hartford, Conn.—Superintendent of Streets Philip Hansling, Jr., played the host recently, when Superintendent Frank S. Hamilton and Mr. Tenbrooke, of New Haven, came to the city to inspect the cart flushing method of cleaning the streets which has recently been the subject of more or less discussion as to its merits when compared with flushing by fire hose. The New Haven gentlemen saw the flushing carts in operation at every stage of the game and they returned to New Haven, where the hose flushing is the only method employed, convinced that the use of carts is far superior, and they will recommend to the New Haven Board of Street Commissioners that that city purchase three 1,000-gallon carts and begin to flush the streets with them. Hartford is supplied with only two carts, one of which is of 600, the other of 750 gallons capacity.

Kansas City, Mo.—A quarter of a million dollars is the sum asked for by Superintendent of Streets W. E. Griffin for construction and operation during the coming year. Mr. Griffin plans to divide the city into ten cleaning districts and build a sub-station on each lot. A track would be built to each lot and then a car would be placed and filled during the daytime by the street cleaning force. At night the cars would be hauled away, emptied and returned. In order to carry out these plans it will be necessary to increase the street cleaning force of laborers from 75 to 150 men, purchase 40 new carts, employ 40 more drivers and make other additions to force and equipment.

Springfield, O.—Besides giving better satisfaction than sweepers, the street flushers can clean the same length of paved streets 20 per cent. cheaper, according to estimates of Director Lafferty. The merchants whose stores front on streets cleaned by the flusher express the greatest satisfaction with the machine. Instead of having their wares practically ruined by dust blowing onto them, the streets, on the day following the flushing, are perfectly clean and for two or three days after there is but a slight dust raised by passing vehicles. The city has purchased a second machine.

Parks and City Beauty

Arcadia, La.—The Arcadia Civic League recently gave the town such a scrubbing and cleaning as it never had before in all its history. The town was divided into eight districts, and a committee appointed to supervise the work in each district. The work started early in the morning and continued until early in the afternoon, when a heavy rain came, putting a stop to all outside work. Through the co-operation of the town authorities and the citizens generally excellent work was done and will be continued until not a leaf, piece of paper or tin can can be found in the residence or business section of town.

Baltimore, Md.—In the course of a lecture before the Municipal Art Society, Dr. John Quincy Adams commented on one of the drawbacks to civic art, namely, the lack of restriction regarding the height and character of buildings erected. He advocated an extension of the authority of municipal art commissions in the matter of regulating the height and character of buildings overlooking public squares or buildings which in effect formed part of a group of public or semi-public structures.

Detroit, Mich.—The assistance of the city government will be asked in a war on insect plagues which ravage the shrubs and trees in Detroit. A committee of the North Woodward Improvement Association, of which Dr. E. C. L. Miller is chairman, will wait upon the Mayor and call his attention to a law which empowers a city or township government to appoint three men to inspect trees and shrubs and spray the infected ones, when the property owner refuses.

Evansville, Ill.—Charts of the new survey of the parks have been made by City Engineer Saunders and forwarded to Engineer Kersler in St. Louis. Last year the Park Board had to suspend the contract with Engineer Kersler because the city forester's surveys and charts of the present parks were not sufficiently correct. The plans being made provide for one of the finest park systems in the country. The financing of the enterprise still has to be arranged.

Montreal, Can.—An improvement plan for the city has been prepared by the Committee on Civic Improvement of the Quebec Architects' Association, Prof. Percy E. Nobles, Chairman. The plan consists principally in cutting diagonal streets from the center of the city to the principal suburbs. Incidentally, the proposed streets would give much easier grades to traffic ascending the hills than is afforded by the present checkerboard system of laying out streets. Besides the two main diagonal streets, a system of boulevards circling the city and running along the waterfront is contemplated.

New York, N. Y.—The zoological gardens in Bronx Park are praised by Dr. P. Chalmers Mitchell, F. R. S., Secretary of the Zoological Society of London. In the matter of size the Bronx gardens are six times as large as those in London. The large paddocks for buffalo, sheep, bears and other animals struck him as being especially fine. The success in caring for live animals excited his admiration.

St. Louis, Mo.—The Board of Public Improvements has approved an ordinance submitted by President A. J. O'Reilly providing for the purchase by condemnation of the block west of City Hall square. This block, measuring 400 by 790, is bounded by Thirteenth, Market and Center streets and Clark avenue and is needed as a loca-

tion for the new jail, civil, criminal and police courts and Police Headquarters. The $2,000,000 which has already been appropriated will only be a beginning, and a new special architectural board will have the erection of the buildings in charge.

Rapid Transit

BALTIMORE, MD.—A reported plan of the United Railways and Electric Company to allow the city to appoint a director on the company's board is receiving more favorable comment in financial circles than it did when the subject was first broached. By those who favor the move, it is contended that some method should be devised for removing the antagonism existing against the corporation on the part of many citizens. Mayor Timanus and the city officials who favor the director plan feel that there are many questions arising between the city and the company which could be satisfactorily settled if the city had some authoritative voice in the management.

CLEVELAND, O.—The Cleveland Electric Railway Company has suspended operation of cars on thoroughfares on which the United States Supreme Court some time ago declared that the franchises had expired. Cars have been run over these tracks under a temporary arrangement with the city, a fare of three cents being charged. After notifying the city that it was losing money and could not continue the arrangement, the company attempted to remove its tracks, but was prevented from doing so by the police.

COLUMBUS, O.—The passage of a general ordinance requiring the laying of grooved rails on all streets when they are paved, by all railroad companies operating within the city, is recommended by City Solicitor Marshall, in view of the long litigation that may be required to settle the construction of the numerous franchise ordinances now in force. "That such an ordinance would be valid in governing future construction," he says, "there is little doubt. The powers conferred on municipal corporations of improving and repairing streets and keeping them open and free from nuisance, are held in trust for public purposes and are continuing in their nature, to be exercised from time to time as the public interest requires. Valid grants could have been given without any reference to the character of rails to be used in laying tracks. It is clear that the city is not bound for the life of such franchises to the kind of construction provided for in said ordinances. If the public interest requires a different construction of tracks than that found in any franchise ordinance, that construction may be required at any time."

NEW ORLEANS, LA.—The annual report of the New Orleans Railway and Light Company for the year 1906 contains the following figures regarding maintenance: Track roadway and paving, $957.95 per mile; electric line, $261.10 per mile; electric cars, $207.36 per car; electrical equipment of cars, $164.14.

NEW YORK, N. Y.—The Wagner bill, providing for a five-cent fare to Coney Island and universal transfer in New York City over all lines owned and operated by the same company, has passed the Assembly and is being considered by the State Senate at Albany.

The Railroad Commissioners of New York State have issued a summary of cash fares, transfers and car mileage of the surface, elevated and subway lines in the five boroughs of New York City for the year ended December 31, 1906. Totals of these are: Cash fares, 1,289,094,974; transfers, 347,332,281, and the car mileage, 243,514,404. The increases over the previous year were: Cash fares, 117,943,276; transfers, 76,136,857; car mileage, 13,264,949. Quarterly reports hitherto issued by this commission have been discontinued.

PHILADELPHIA, PA.—Governor Stuart has signed the act permitting cities to make contracts with trolley lines. Under this bill it is expected the Councils will confirm to the Rapid Transit Company a monopoly of street car service, relieve it of present obligations and bind the city to its corporate interests by providing for the election to its directorate of representatives of the city.

WOONSOCKET, R. I.—The express delivery service of the New York, New Haven and Hartford Railroad Company's trolley lines will shortly be extended to Woonsocket, according to statements of General Traffic Manager Smith, who is enthusiastic over the possibilities of the trolley-express business. The opening of the new lines will make it possible for merchants to receive goods from Providence within two hours after delivering the order.

Miscellaneous

BOSTON, MASS.—Continental subway systems do not compare favorably with that of Boston, according to Thomas J. Gargan, of the Transit Commission, who has just returned from Europe, where he made an exhaustive study of the question. The most comprehensive system abroad is that of Paris; it is inferior to the Boston system in the matter of light, ventilation and minor details. The Berlin system has some excellent points, particularly a device for indicating in each car the name of the next station to be reached and a system for illuminating the name at each station. In Berlin, too, the stations are well provided with exits, as safeguards in case of fire. In London Mr. Gargan was disappointed in the new tubes on account of their small size and poor ventilation. In the matter of ventilation of subways the Commission considers that Boston is many years in the lead of other cities.

BROOKLYN, N. Y.—The estimated cost of the new 10-story municipal court building, to be erected on Court, Livingston and Joralemon streets, has been reduced from $8,400,000 to $6,000,000 by making some changes in the plans.

CHICAGO, ILL.—The Wide Tire Ordinance goes into effect May 1. The original wide tire ordinance was passed in June, 1903. In order to deal fairly with team owners and give them sufficient time to comply with the requirements, the ordinance was to become effective in January 1907. Last December another ordinance, less stringent in its terms, was passed and the time for it to go into effect extended as stated.

HARRISBURG, PA.—Governor Stuart has signed the Homsher trolley freight bill, which becomes effective at once. It allows trolley companies to carry freight, and to handle an express business of milk, produce and the like. The bill passed both Houses of the Legislature by practically a unanimous vote.

PORTLAND, ORE.—An increase in the license fee for saloons went into effect April 1, the increase being from $500 to $800. It was supposed that this would have the effect of greatly decreasing the number of saloons. However, only two saloons went out of business, and 441 retained their licenses.

SCRANTON, PA.—The way many property owners erect their buildings, causing them to project over the building line, is a source of annoyance to Superintendent of Building Inspection E. L. Walter, who is determined to do all in his power to have the evil remedied and advocates the setting of buildings ten feet back from the fence line. An effort is to be made to have Councils pass ordinances fixing more definitely the building line and eliminating the objectionable "bay windows," which now break up the store front of every business block in the city.

REVIEW OF THE PERIODICALS

Abstracts and Synopses of the Most Important Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading United States Periodicals and a Few Others

Municipal Electric Light Plants

JAMES R. CRAVATH, Western editor of the *Electric World*, in *The World Today* discusses the advisability of municipal operation of electric-light plants from the point of view of an electrical expert. The writer gives a much more unprejudiced statement than those usually presented, although he appears to favor private ownership somewhat; one indication of this being that a list of fourteen municipal plants is given as failures (some of which are not so), and only three as successes, than which there are several more successful. He also gives only passing notice to the fact that a number of private plants have been financial failures, although he mentions that twenty-four in Massachusetts alone paid no dividends in 1905. He, however, explains that "in the case of a large number of the electric plants owned by municipalities in the United States, the question of City vs. Private Ownership was never an issue, for the reason that the towns are so small and the profits so uncertain, that if the city did not build the plant no one else would." His general argument is that there is only a fair profit in the electric-light business, and a margin so small that good or bad management can throw the balance one way or the other; and that, since both profit and quality of service are matters of management, the whole question hinges on this. But a manager is more certain of advancement with a private company that with a city and more certain of criticism with the latter; wherefore the municipality finds more difficulty in obtaining a good manager (assuming it knows enough to want one) than does a company. All of which seems to be sound argument.

Depreciation and Reserves

UNDER the above title there appeared in the *Electric Railway Review* for April 13 a lecture delivered by George Wilkinson, Public Accountant, before the Wharton School of Finance and Commerce. Depreciation he defines as "the loss in value of some destructible property over and above current repairs. The loss which arises with respect to breakage and which can be replaced by repairs has nothing to do with depreciation." He illustrates it by the lessened valuation which fire adjusters would allow for a plant which had been in operation for some time; which valuation, if correctly made, plus a proper depreciation fund should be sufficient to rebuild the plant. In fact, although he does not refer to it, the setting aside of a depreciation fund is very similar to paying fire-insurance premiums, with the difference that the occurrence of fire is doubtful, while depreciation is certain. He refers to Mr. John W. Alvord's tabulation of the life of 32 boilers with actual lives of 6 to 23 years, depending partly upon the kind of water used. New plant and betterments should not, says Mr. Wilkinson, be charged against earnings, and if they are the depreciation charge should be diminished by an equal amount. Also it is well, as a matter of policy, not to begin charging depreciation until the plant has got into running order, physically and financially, say the second year of its working. Further details are given concerning modern methods of bookkeeping.

Municipal Ownership

The Arena for April contains a very interesting discussion of municipal ownership in Great Britain. This is begun with a strong article by H. Gardner McKerrow, in argument against the policy. Following this there is an article by Professor Frank Parsons, in reply to Mr. McKerrow; and then, Professor Parsons not having quite annihilated him, the leading editorial makes further reply in affirmative argument. Thus there is clever presentation and marshalling of arguments both for and against, and the advocate of either side can strengthen his position and gain answers to the enemy from reading the magazine. The layman who has not made up his mind is more likely, as a result of the reading, to be impressed with the two-sidedness of the matter than to be helped to a definite conclusion. If he does reach one, it is probable to be to the effect that so much depends upon the personal equation—upon the conduct of the concrete municipal ownership undertaking—that abstract discussion of the subject is unpractically academic. And that perhaps is a wise decision. To review the three articles is impossible in limited space. McKerrow begins by giving a lot of statistics, both as to operation and as to taxes. This rapid-fire discharge is returned in kind, and at least as effectively, by Professor Parsons; but the statistical aspect of municipal ownership is generally admitted not to be its most important phase. The relation of municipal ownership to the general progress of what may be somewhat sweepingly termed urban civilization is discussed at more length by McKerrow than by his opponents. He points out the danger that lies in the municipal employees' vote, these employees in London being already 5 per cent. of the registered voters, and in Melbourne, Australia, "a clear majority"—a danger such that even "John Burns has said that the only remedy for, and safeguard against, this danger is the disfranchisement of municipal employees." It is, or tends to be, in their power to vote

themselves any wages and to form an impregnable political machine. He also notes the blasting effect of municipal ownership upon private enterprise, so that "in 1896, when the United States had 10,000 miles of electric tramways, in England there were just 20 miles"; and that in 1902, when in the United States there were 3,620 electric stations, in England there were 457, though English capital was then promoting such enterprises all over the Continent. He admits the superiority of the municipal service over that previously given by the private corporations; but claims that it represents no more than the normal progress to be expected everywhere. None of these points is refuted in the other articles.

Another interesting, if slightly irrelevant, matter brought out by McKerrow, is the distinct movement that is arising in England in favor of some form of franchise for corporations that pay large taxes. This is so opposed to the current American sentiment as to challenge thoughtful attention. The movement bases its plea on simple justice. The London *Times* notes that a railway which paid $380,000 in taxes in 1882, was obliged to pay $1,000,000 in 1901, "without having any share in the control and expenditure of the money it provided." Lord Aveberry, speaking in London last July, tersely put the matter as follows: "The Midland Railway pays one-eighth of all the rates in Derby; one shipbuilding company pays one-sixth of all the rates at Jarrow, and yet they neither of them have a single vote. Thus, while thousands who pay no rates have votes, those who pay thousands in rates have none." Similar expressions are quoted, and it is stated that "at a meeting of the Association of Chambers of Commerce at Bristol, on September 11, 1906, it was agreed by a large majority to organize a deputation to the government complaining" of this condition.

Urban Immorality

GEORGE KIBBE TURNER'S article in the April *McClure's*, "The City of Chicago, a Study of the Great Immoralities," is not pleasant reading. To any one with Dr. Guthrie's ideal and dream, that cities are "as lamps along the pathway of humanity and religion," it must come as a shock. But because its statements are true, it is a shock that ought to be had. The pity of it is that Chicago is described, he says, "not because it is worse than or different from other cities of America, but, on the contrary, because it is so typical." Mr. Turner defines his article as a study of "the tremendous and elaborate organization —financial and political—for creating and attracting and protecting the criminal in Chicago." It is something for the honest citizen, be he official or simply an elector, to read with righteous resolution, even though remembering that it is only one side of the picture.

The author, taking up "the business of dissipation," says that the receipts of the retail liquor trade in 1906 were considerably in excess of one hundred million dollars; that there was one retail interest greater—the sellers of food, grocers and meat men, and that no other business had anything like as many establishments as had the liquor business. Back of the saloons, and largely owning them in one way or another, are the breweries, which, he says, have been lately so overbuilt and overcapitalized that fully one-third of the capital is earning no dividends. Consequently, the breweries "can have but one aim—to fill Chicago with beer to the point of saturation." The description of how this is managed is instructive, and the effects—briefly described as "ethically hideous and socially suicidal"—are no more than suggested, for the author's resolve is to have "no emotion, no squeamishness, not even sympathy; simply a statement of business facts." He sees a ray of hope for the future in the new license law which limits the number of saloons to one for five hundred people. The proportion now is about twice that. Coming next to prostitution, the author says that there are "at least ten thousand professional prostitutes" in Chicago, and that the gross revenues from the business last year were at least $20,000,000. He says that there are recorded 292 criminal hotels, of which twenty-one have more than a hundred rooms each—one of them 250 rooms —and a total of ten thousand rooms. Then there are the smaller places, and the business is described as much more elaborately organized than most persons suppose. The sale of cocaine is noted as a detail of it. The "third large business of dissipation," says Mr. Turner, is gambling. He puts the receipts of this in 1906 in Chicago at $15,000,000. Thus he figures a total revenue of at least $135,000,000 for this general business, and the direct employment in it of at least 40,000 persons. It is all either under the strict regulation of law, or in direct defiance to it, and the opportunity of the political bosses, in selling privileges for votes, is thus created. This is described with much instructive detail.

Washington's Growth in Beauty

Park and Cemetery for April summarizes a report by George H. Brown, the landscape architect for the public grounds of the National capital, to Col. Bromwell, the engineer in charge. The result is an interestingly concise statement concerning the ornamental spaces that are so conspicuous a feature of the present Washington, and their development in the course of thirty-five years. Three and a half decades ago most of them were unsightly waste places, covered with debris and weed growth, and even a menace to the city's health. Of the large parks, few at that time had recovered from their occupancy by the army for hospitals, barracks and cattle pens during the war; and the old canal and Tiber creek, though flowing through "the Mall," received the sewage of the city. The canal and its basins are now filled up, and the creek, into which no sewage now goes, has been arched over. Thirty-five years ago there were only four statues, where to-day there are twenty-nine; and the street trees that, happily, were planted years ago with order and system, have grown into dignity and beauty. This transformation of Washington, coming as it has without any special consistency of intelligent effort, may well be encouraging to those many towns and cities that are now taking up with enthusiasm the cause of city beauty. In her change they can see what theirs may easily be.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Periodicals Listed Below

Acetylene Journal, Chicago.
Ainsley's Magazine, New York.
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Sewage Lifting in Flat Districts.—Describing hydraulic ejector. Thos. F. McGilvray. 3-4 p. Canadian Contract Record, March 27.

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Brockton, Mass., Water Supply System, Description. Abstracted from paper before New England Waterworks Association, by Charles R. Felton. Illustrated. 1 p. Engineering Record, April 6.

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Pumping Plant at Rocky Ford, Col.—Producer gas engine. 1,000-gallon plant. Illustrated. 1 1-4 pp. Engineering Record, April 20.

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Purification of Water Supplies.—Report of State Biologist Gerald McCarthy. 3-4 p. Fire and Water, March 30.

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Preliminary Water Filters. Washington and Albany plants. 1-2 p. Municipal Journal and Engineer, April 17.

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Municipal vs. Private Water Works in Great Cities, New York and San Francisco Compared.—Paper before Technical Society of the Pacific Coast, by Marsden Manson. History of San Francisco's efforts toward municipal ownership. 22 pp. Journal of Association of Engineering Societies, March.

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Municipal Electrical Supply in London. Amounts, cost, price, etc. 1-2 p. Municipal Journal, March 29.

Power Supply in London. Discussion of propositions involving municipal supply of electric current. 1-2 p. Engineering Record, April 6.

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Arc Lighting, Blondell's System of.—Description of new treatment of carbons claiming increased conductivity, life, etc. Illustrated. Isidor Ladoff. 7 1-2 pp. Illuminating Engineer, March.

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Gas Pipe Joints, Defective, at Burlington and Winooski.—Correspondence concerning Universal pipe. 1-4 p. Engineering News, April 11.

Cheap Gas. Controverts article by Chas. H. Cochrane in Moody's Magazine for March. 3-4 p. Progressive Age, April 1.

Removing Naphthaline from a 16-inch Gas Pipe. Description, with discussion. D. F. Burritt. 3-4 p. Progressive Age, April 15.

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Fire Prevention.—By F. W. Fitzpatrick, executive officer, International Society of State and Municipal Building Commissioners and Inspectors. 10 pp. Illustrated. Metropolitan Magazine.

Time Saving in Fire Departments.—Arguments for and against hitching up for all alarms. 1 p. Fireman's Herald, April 13.

Two Platoon System for Firemen.—Arguments against. 2 1-2 pp. Fireman's Herald, March 30.—1 p. Fireman's Herald, April 20.

Fire Insurance Boards.—A plea for co-operation of these with municipalities to encourage improved conditions. Frank R. Fairweather. 5 1-2 pp. Insurance Engineering, March.

The Police Force of New York; A Semi-Secret and Semi-Criminal Organization.—By Samuel Hopkins Adams. 1 p. Illustrated. Collier's, March 30.

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Municipal Government by Commission.—Paper before Union of Alberta Municipalities, by ex-Mayor Short, of Edmonton. 2 1-2 pp. Canadian Municipal Journal, April.

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"The Revolution in Chicago's Judicial System," by Stanley Waterloo. 4 pp. Review of Reviews, April.

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"The Political Tangle in San Francisco." The Rise of the Labor Party and the Indictment of Mayor Schmidtz, by Jerome A. Hart. 5 pp. World's Work, April.

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Uniform Systems of Records and Accounts. Paper by Alexander C. Humphreys, with discussion. 5 3-4 pp. Water and Gas Review, April.

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"Is New York City Bankrupt?" A popular account of the improvident issue of bonds by the city. By Frederick Upham Adams. 4 pp. Broadway Magazine, April.

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Depreciation and Reserves. Lecture before Wharton School of Finance and Commerce, by George Wilkinson. 2 1-2 pp. Electric Railway Review, April 13.

Municipal Ownership of Electric Light Plants.—By James R. Cravath. 5 pp. The World To-day, April.

The Staten Island Ferry. "An Example of Municipal Operation," by John Martin. 2 1-2 pp. The Independent, April 4.

"Some Results in Municipal Ownership in Great Britain," by H. Gardner McKerrow. 9 pp. The Arena, April.

"Mr. McKerrow's Argument Against Municipal Ownership." A reply. By Prof. Frank Parsons, Ph.D. 4 pp. The Arena, April.

"Public Ownership in Great Britain." A further reply to Mr. McKerrow's argument. Editorial. 3 1-2 pp. The Arena, April.

"Public Ownership News." Notes from various cities and countries, by Ralph Albertson. 4 pp. The Arena, April.

Municipalization in England and Lord Avebury. Discussion of the arguments of the latter. 1 1-2 pp. Revista Municipal, April 1, April 15.

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New York Public Utilities Bill. Excellent résumé of provisions of bill as introduced. 2 1-2 pp. Electric Railway Review, April 6.

Recommendations for New Jersey Cities by State Commissions. 1 p. Municipal Journal and Engineer, April 24.

Municipal Reference Bureaus. Notes concerning these in Baltimore and other cities. 1 p. Bulletin, League of Am. Municipalities, April.

REFUSE COLLECTION AND DISPOSAL

Refuse Disposal Works of Tottenham, England.—Description of a 10-cell plant. 1 p. Contract Journal, March 27.

Disposal of Municipal Waste. Description of various furnaces. Illustrated. W. F. Morse. 4 pp. Municipal Journal and Engineer, April 3.

Garbage Crematory, An 18-ton.—At U. S. Army Post, Ontario, N. Y. Illustrated. 3-4 p. Engineering Record, April 13.

PARKS AND CITY BEAUTY

"Parks and Street Trees of Washington."—Summary of a report from George H. Brown, Landscape Gardener of Public Grounds. 2 1-2 pp. Illustrated. Park and Cemetery, April.

Concrete Surface Treatment in Parks. Extracts from recent article in "Cement." By Linn White, engineer of South Park Commission, Chicago. 1 p. Park and Cemetery, April.

Park Improvement News Notes. 2 1-2 pp. Park and Cemetery, April.

City Plans, Recent Reports on.—Review of those for St. Paul, St. Louis, Boston and New York. Illustrated. Chas. Mulford Robinson. 4 1-2 pp. Editorial, 1-2 p. Municipal Journal and Engineer, April 3.

Improvement Plan for Montreal. Recommendation of Quebec Architects' Association. Illustrated. 3 1-2 pp. Canadian Municipal Journal, April.

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Tree Culture in New York.—Methods employed by Park Commissioners. 1 1-2 pp. Municipal Journal and Engineer, April 3.

Street Tree Inventory. Method employed in Hartford, Conn. Illustrated. Geo. A. Parker. 2 pp. Municipal Journal and Engineer, April 3.

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Cleveland's Street Railway Situation.—History and present condition. 2 pp. Street Railway Journal, April 6.

Cleveland Street Railway Valuations. Statements of Messrs. Andrews and Du Pont on valuation. 1 1-4 pp. Street Railway Journal, March 30. Electric Railway Review, March 30.

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Civic Improvements, Notes on Current News of.—2 pp. Notes and Comments Department, Architectural Record, April.

Notes on Current News of. 6 pp. Park and Cemetery, April.

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Descriptions of Cities.—New York, The Hugeness of. By René Bache. 12 pp. Illustrated. Pearson's Magazine, April.

New York: "As the City Seems to the Artist." By Annie Nathan Meyer. 5 pp. Illustrated. Broadway Magazine, April.

"The City of New Orleans." A series of drawings, with brief text. By Vernon Howe Bailey. 7 pp. Everybody's, April.

"Chicago, the Romance of," by Newton Dent. 16 pp. Illustrated. Munsey's, April.

"The City of Chicago: a Study of the Great Immoralities." By George Kibbe Turner. 18 pp. Illustrated. McClure's, April.

San Diego, Cal. By Theodore Van Tyne Johnston. 7 pp. Illustrated. The Independent, April 4.

Richmond, Va. A pleasant essay devoted largely to human types in Richmond. By Charles Henry White. 7 pp. Illustrated. Harper's Magazine, April.

Caracas: "Venezuela, the Capital and the Government." No. VII. of the South American Situation series. By Albert Hale. 14 pp. Illustrated. Reader Magazine, April.

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Birmingham, Ala. Its government, commerce, etc. Illustrated. 3 pp. The Financier, April 8.

American and English Cities Compared, especially population and finances. Wm. S. Crandall. 3 pp. Bulletin, League of American Municipalities, April.

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Public Buildings.—The Newark (N. J.) City Hall. Description of. 8 pp. Illustrated. Architects' and Builders' Magazine, April.

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Suburbs.—Advantages of: "Why I Chose a Suburban Home." By Francis E. Clark, D.D. 3 pp. Illustrated. Suburban Life, April.

Suburban Architecture, Boston. By Frank Chouteau Brown. 36 pp. Illustrated. Architectural Record, April.

"Suburban Betterment: What a Hartford Suburb Owes to Its Improvement Society." By Frank G. Macomber. 1 p. Illustrated. Suburban Life, April.

"Suburban Cottages versus Flats." Editorial. 1 1-4 pp. The Independent, March 28.

Suburban Development.—Popular discussion of requirements. Illustrated. Alex. Black. 2 pp. Contract Journal, April 10.

Port Administration and Harbor Facilities.—Symposium covering New York, Chicago, Philadelphia, Boston, Buffalo, New Orleans, Detroit, Washington, Providence, Wilmington, Duluth, Tampa, London, Manchester, Hamburg, Barcelona and Antwerp. By city officials and others. 44 pp. Annals, Am. Academy Political and Social Science, March.

Public Franchises as Corporate Property; Should they be so treated?—Discussion of sale, taxation, appraisement, etc., of franchises. Arthur W. Spencer. 4 pp. Annals, Am. Academy Political and Social Science, March.

Street Nomenclature.—Advocates systematic numbering of streets. Illustrated. S. N. Stewart. 2 pp. Municipal Engineering, April.

Engineering Societies Building.—6 pp. of illustrations. Architectural Record, April. 3 1-2 pp. Building Magazine, April. 2 pp. Electric Railway Review, April 6. 2 pp. Engineering Record, April 6. 7 pp. Iron Age, April 11. 6 pp. American Architect, April 13. 4 pp. Power, May. 1 3-4 pp. Street Railway Journal, April 20.

BOOK REVIEWS

Attrition Tests of Road-Making Stones.—By E. J. Lovegrove, M. Inst. C. E. With Petrological Descriptions by John S. Flett, F.R.S.E., and J. Allen Howe, B.S.C. London: St. Bride's Press, Ltd. Cloth, 80 pages, 9x11 inches, illustrated. Price, $1.75. The determination of the comparitive value of rocks for road-making purposes is the object of this work. To ascertain this tests extending over a period of ten years were made. Each rock examined was subjected to attrition tests, both dry and wet, and the percentage of loss determined. In addition to the petrological description accompanying the tests of each stone an illustration of a section of the stone is also given. While the stones examined are all to be found in Great Britain, there is no reason for supposing that the conclusions arrived at are not general in their application. The most important result arrived at is that the hardest and toughest stones combine an abundance of hard mineral— e. g., quartz—with a dense fine-grained texture. Porosity was found to be conducive to low attrition tests. The very best tests were obtained from altered or metamorphosed (not disintegrated) rocks, this apparently being due to fineness of texture and the interlocking of the grains.

Die Buchführung für Gasanstalten. (Bookkeeping for Gas Works.)—Von Karl Schaefer. München, Germany. R. Oldenbourg, 1906. 206 pages, cloth, 6½x9½ inches. Price, $2.00. Although a treatise on accounting, written for those having such matters in charge in connection with gas works, a good deal of information of interest to a more general reader is also contained in the work. For instance, in discussing the determination of the amount of gas used in unmetered street lights a table is presented in which the

time of lighting and extinguishing is noted even to the quarter hour for each day of the year. Conservative methods of accounting are shown in the schedules of depreciation in which twenty per cent. per annum is deducted from the cost of tools, and ten per cent. from the cost of apparatus. For the most part, however, the book is made up of blank forms, tables and sample pages of books of interest only to the gas works accountant or manager.

MUNICIPAL REPORTS

Mayor's Message, Albany, N. Y.—The message of Charles H. Gans, Mayor, sent to the Common Council, January 7, 1907, is published in pamphlet form. It is a review of the whole field of municipal activity. Among the improvements to be made one of the most important is the improvement of the water front, which involves the construction of an intercepting sewer, new dock walls and a recreation pier. Referring to pavements, an exception to the general satisfactory condition of streets is noted in regard to South Pearl Street, which was paved with asphalt blocks, which are rapidly disintegrating.

Water Commissioners, Bradford, Pa., being the twenty-fifth annual report for the year 1906.—The total receipts of the Department were $29,331 and the disbursements $32,437. Superintendent Heffner estimates that the city uses $14,000 worth of water for which no credit is given the Department. The disbursements contain an item of $15,000 for the purchase of water rights. The total cost of the works to date is $421,798.

Sewerage and Water Board, New Orleans, La., being the fourteenth semi-annual report to the City Council, dated December 31, 1906.—The work of this Commission comes under three heads, water, drainage and sewerage. During the half-year waterworks affairs have occupied a large part of the time of the Commissioner. Illustrations of the Main Water Purification Station, a handsome building, occupy a prominent place in the published report. A contract for water purification plants has been let for $1,840,727. As to sewerage works the present status is: miles laid 223.9, or 59.2 per cent. of entire system; miles under contract 49.9, or 13.2 per cent. of entire system; miles yet to be let 104.7, or 27.6 per cent. of the entire system. There has been spent to date $3,869,441, or 73.5 per cent. of the entire estimated cost. Of the water distribution system 34 miles of main have been completed at a cost of $983,305. Contracts for 109.5 miles, costing $2,921,251, have been let, but not completed. There still remain to let contracts for 309 miles at a cost of $2,814,388. The drainage work to date has cost $4,763,462, and consists of 25.9 miles of open and unlined canals, 3.8 miles of timber lined canals and 18.8 miles of lined and covered canals. Some trouble has been experienced with caving in of banks of unlined canals. To obviate this it is proposed to line the bottoms and sides to a certain height with timber and giving a flat slope to the earth embankment above.

Councilmanic Directory, Harrisburg, Pa.—A neat pocket volume for the information of city officials and others; contains the names and addresses of members of the city government. A large part of the book is occupied with compilations, by Charles A. Miller, City Clerk, on Legislative Practice, Joint Rules and Rules of the Select and Common Councils.

Greenville, S. C., Beautifying and Improving, being a report to the Municipal League, by Kelsey and Guild, Landscape Architects, Boston, Mass.—This is an excellent illustration of the application of certain fundamental principles of correct city growth to a moderate sized town, and the subject is tersely treated for the convenience of the busy man.

Public Library, Washington, D. C., 1905-6.—Librarian George F. Bowerman reports a reduction in the proportion of fiction circulation from 83.7 per cent. in 1903-4 to 71.8 per cent. The importance of open access to books is commented on as a means of improving the quality of the reading.

Willard Park, Battle Creek, Mich., a report on improvements to. By Howard Evarts Weed, Chicago.—This is a brief report on contemplated improvements on a little park of sixteen acres, situated two and a half miles from the city on the south shore of Gougas Lake. The park has natural beauty, but needs improvement, not the least of which is a proper entrance. The report contains suggestions for practical and inexpensive development.

Water Department, Attleboro, Mass., being the fourteenth report of the Department for the year ended December 31, 1906.—The Attleboro Waterworks supplies a town of 14,000 inhabitants with an average of 640,653 gallons a day, or 43 gallons per inhabitant. The number of meters in use is 1,875. The income of the works for the year was $36,373, of which $1,000 was the town appropriation; the cost of maintenance was $29,873, and the balance was placed in the sinking fund. Included in the report is an interesting account of the methods employed to make the new concrete steel reinforced standpipe watertight. Of the 71 leaks which Superintendent G. H. Snell reports 17 were on mains, 28 on services (nine caused by electrolysis), 12 on gates and 14 on hydrants.

Forms for Concrete Construction. By Sanford E. Thompson, Consulting Engineer. Bulletin 13 of the Association of Portland Cement Manufacturers.—This pamphlet, which contains a paper read before the third annual convention of the National Association of Cement Users, contains suggestions for the guidance of contractors and engineers. A number of illustrations accompany the text.

The Charity Organization Society of the City of New York.—Twenty-fourth Annual Report, for year ended September 30, 1906. The work of the society is very practical and aims to remove the causes of poverty as well as to relieve want. One of the principal causes of poverty is the concentration of manufacturers in the central portions of the city, thus compelling the workmen to pay the high rents due to crowding or stand a daily tax in the way of car fares. Legal regulation in matter of locating new factories is suggested as a practical and effective remedy. Detailed reports from each district into which the city is divided are given. Considerable space is given to the work of preventing and treating tuberculosis.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Municipal Interest

DROP MANHOLE PATENT

Donahey vs. **Centreville.**—The patent granted to J. P. Bates in 1902 and assigned to Alexander Donahey has been declared invalid. A suit to recover royalties of $10 each for every manhole on the sanitary sewage system of Centreville, Ia., was brought in 1906. The court held that the device was not patentable. The defence also was ready to produce evidence as to priority of use.—U. S. Court, Keokuk, Ia.

DAMAGE FROM SEWAGE

Virginia Hot Springs Co. vs. **McCray.**—The defendant had constructed a large and expensive hotel plant, including a sewerage system which drained into a stream flowing through the plaintiff's land. More than five years after the hotel and sewer system had been in use, the plaintiff sued for permanent damages for the nuisance caused by the pollution of the stream by this sewage. The court held that the coming action was barred by the five-year tort statute of limitations.—Virginia Supreme Court.

MAYOR'S SALARY

Griffin vs. **Drennen.**—Former Mayor Drennen will have to pay back to the city of Birmingham, Ala., an amount paid him in excess of the amount allowed him under the city charter. The charter of the city before the amended charter went into effect allowed the Mayor's salary to be $2,500 per annum. The City Council voted the salary at $3,600 per annum. W. M. Drennen served Birmingham as Mayor three terms, but the advance in salary was not given the entire length of time.—Supreme Court of Alabama.

PIPE IN HIGHWAY

Hardman vs. **Cabot.**—A pipe line laid in a public rural highway under proper authority and used for supplying the public with natural gas for heating and illuminating purposes, although imposing an additional public service upon the road, is not a use in excess of the right of the public in such road, and does not impose an additional burden upon the estate in fee in the land.—Supreme Court of Appeals, West Virginia.

TELEPHONE WIRES

Beyers vs. **State Line Telephone Co.**—The telephone company had its poles erected and wires strung along the highway in front of Mr. Beyer's property near Manchester, Dutchess county, without his permission, and he brought suit to recover the possession of all the property occupied by the telephone company. The case was decided in favor of the plaintiff. This decision is of particular interest because it shows that a telephone or telegraph company has no right to place its poles on a person's property along the highway without his permission.—Supreme Court, Poughkeepsie, N. Y.

PLUMBING REGULATIONS

Aurora vs. **Ruddy.**—The opinion of the court that the act of 1897 requiring plumbers in cities, towns and villages of 5,000 or more inhabitants to obtain certificates, and requiring cities, towns and villages of 10,000 or more inhabitants to appoint and maintain a board of examiners to inquire into the qualifications of persons engaged in the plumbing business and issue certificates, is a valid exercise of the police power of the State, is not a local or special law and does not confer arbitrary powers upon the boards of examiners.—Supreme Court, Illinois.

NEWS OF THE SOCIETIES

American Society of Civil Engineers.—The thirty-ninth annual convention will be held in Mexico City, Mexico, during the week beginning July 8, 1907. The committee of the Board of Directors having matters in charge are A. L. Bowman, J. Waldo Smith and Chas. Warner Hunt. The meetings will be held in the Engineering School and Mines Building through the courtesy of Mr. Leandro Fernandez, Minister of Public Works, who will deliver an address of welcome to the Society. The entire program will probably cover a period of ten days and will consist of local excursions to points of professional and general interest. Through the courtesy of the Mexican Light and Power Company, R. F. Hayward, General Manager, the entire party is invited to visit the plant at Necaxa. The Mexican Railway will arrange an excursion to Orizaba, which will give an opportunity to view some of the finest mountain scenery in Mexico. The topics for informal discussion, some of which were selected after conference with members of the Society of Mexico, with special views of giving attention to topics of general interest to engineers of that country, are as follows:

(1) **Water Supply.**
Is it better policy to purchase and control watersheds, thereby preventing the pollution of impounding reservoir supplies, or to suffer a certain amount of pollution of such supplies, relying upon filtration to correct the effects thereof?

(2) **Foundations.**
(a) What is the best system of construction for foundations of heavy structures on ground such as that of the City of Mexico, which is an alluvial deposit about 300 feet in depth, and similar in character to that at New Orleans?
(b) Will iron or steel used in foundations, independently or in combination with other materials, last indefinitely when in direct or indirect contact with water?
(c) Will the strength and durability of concrete in foundations be affected if before setting there is: (1) An excess of water; (2) lack of compression; (3) too rapid desiccation?

(3) **Pavements.**
Will the paving materials of the present be used in the construction of the pavements of the future?

(4) **Electric Railways.**
(a) What are the factors which determine the maximum economical grade for electric railways?
(b) In establishing direct lines with heavy grades, under what conditions will it be found practicable to use electric locomotives and gas-engine generating stations, rather than traction by steam locomotives?

(5) **Gas Engines.**
(a) What is the best apparatus and most economical system for cleaning producer or furnace gas, to be used in gas engines?
(b) To what extent is ordinary producer gas, made from bituminous coal, used in gas engines, and what practical results have been obtained, by any methods for removing tar or soot?

Municipal Art Association of Indianapolis.—Permanent organization of the new association was perfected April 19 by the adoption of a constitution and the election of twelve directors. The object of the organization, as stated in the constitution, is as follows: "To conserve and enhance in every practical way the beauty and comfort of the city of Indianapolis and of its streets, boulevards, buildings, parks, bridges, streams and other public places and utilities; to stimulate interest in the scenic, artistic and architectural development of the city, and to encourage a greater civic pride in the care and improvement of public and private property." The directors elected were C. C. Brown, C. A. Kenyon, W. W. Woolen, Arthur Bohn, Louis H. Gibson, C. A. Wallingford, H. H. Hanna, C. J. Buchanan, J. Clyde Power, W. K. Eldridge and Mrs. Corinna Barnes. The eight first-named were nominated by the membership, while Mr. Power, who is superintendent of parks, was nominated by Mayor Bookwalter, Mr. Eldredge by the Board of Trade and Mrs. Barnes by the Local Council of Women. Nominations are yet to be made by Governor Hanly, the Board of School Commissioners, the Merchants' Association, the Commercial Club, the County Commissioners and the Manufacturers' Association.

Detroit Municipal League.—Sixty members of the Society met at Hotel Tuller, April 19, President J. L. Hudson in the chair. The subject of the meeting was the civil service measure now pending in the Legislature, Sherman D. Callender, counsel of the League, gave a historical survey of local movement for civil service. Representative Jos. M. Weiss, who introduced the bill, explained its terms. Prof. John A. Fairley gave a review of the civil service question throughout the country. Resolutions were adopted favoring the bill.

League of Michigan Municipalities.—The ninth annual convention will be held at the Art Museum, Detroit, Mich., June 6-8. It is the intention to devote a large part of the time to the consideration of practical questions. Professor Gardner S. Williams will speak on the question of water supply. A roll call of cities will give every city an opportunity to report on their recent progress. A special conference of Comptrollers and Clerks on the proposed Uniform Accounting Law will be held. An exhibition of machines and appliances employed in municipal work will be held. Visits will be made to public property and works in the vicinity. It is expected that the attendance will be about five hundred. The Chairman of the Executive Committee is J. L. Hudson, of Detroit.

Calendar of Meetings

May 2-4.
American Electrochemical Society.—Annual meeting, Philadelphia, Pa.—S. S. Sadtler, Secretary, 39 South Tenth street, Philadelphia, Pa.

May 8-10.
Texas State Firemen's Association.—Convention, McKinney, Tex.—W. M. Abernathy, Mayor, Chairman, Committee on Entertainment.

May 15.
American Society of Civil Engineers.—Regular meeting, House of the Society, 220 West Forty-seventh street, New York City.—Charles Warren Hunt, Secretary.

May 15.
Western Society of Civil Engineers.—Regular meeting.—J. H. Warden, Secretary, 1737 Monadnock Block, Chicago, Ill.

May 22-24.
National Fire Protection Association.—Annual meeting, New York City.—W. H. Merrill, Secretary, 382 Ohio street, Chicago, Ill.

May 28-30.
American Society of Mechanical Engineers.—Spring meeting, Indianapolis, Ind.—Calvin W. Rice, Secretary, 12 West Twenty-first street, New York.

June 1-4.
American Anti-Tuberculosis League—Annual convention, Atlantic City, N. J.—Dr. George Brown, Atlanta, Ga., President; Dr. Edward Guion, 1408 Atlantic avenue, Atlantic City, N. J., Vice-President.

June 4-6.
Michigan State Firemen's Association.—Thirty-third annual convention, Detroit, Mich.—A. P. Lane, Secretary, Ithaca, Mich.

June 4-7.
National Electric Light Association—Annual meeting, Washington, D. C.—W. C. L. Elgin, Secretary, 29 West 39th street, New York City.

June 6-8.
League of Michigan Municipalities.—Ninth annual convention, Art Museum, Detroit, Mich.—John A. Fairlie, Ann Arbor, Secretary.

June 12.
National Conference of Charities and Correction.—Thirty-third Conference, Minneapolis, Minn.

June 17-22.
American Water Works Association.—Twenty-seventh annual convention, Toronto, Ontario, Canada.—Dabney H. Maury, President; J. M. Diven, Charleston, S. C., Secretary.

June 18.
International Association of Chiefs of Police.—Annual convention, Auditorium, Jamestown Exposition Grounds.—Major Richard Sylvester, President, Washington, D. C.

June 18-20.
Municipal League of Indiana.—Meeting, Logansport, Ind.—Councilman J. T. McNary, Chairman, Local Committee, Logansport.

June 20-22.
American Society for Testing Materials.—Annual meeting, Atlantic City, N. J.—Edward Marbury, Secretary, University of Pennsylvania, Philadelphia.

June 20-22.
The Playground Association of America.—First Annual meeting, Chicago, Ill.—Dr. H. S. Curtis, Secretary.

June 25-28.
American Institute of Electrical Engineers.—Annual meeting, Niagara Falls, N. Y.—Ralph W. Pope, Secretary, 29 West 39th street, New York City.

June 26-28.
International Association for the Prevention of Smoke.—Second annual convention, Milwaukee, Wis.—Charles Poetke, Smoke Inspector, Milwaukee, Wis.

July 8.
American Society of Civil Engineers.—Annual convention, Mexico City.—Charles Warren Hunt, Secretary, 220 West 57th street, New York City.

July 17-19.
National Electrical Contractors' Association.—Seventh annual convention, New York City.—J. C. Hatzel, Chairman, 571 Fifth avenue, New York, N. Y.

August 6-8.
American Association of Park Superintendents.—Annual convention, Toronto, Ont.—F. L. Mulford, Secretary, Harrisburg, Pa.

August 7-9.
The International Association of Municipal Electricians.—Annual convention, Jamestown Exposition, Norfolk, Va.—F. P. Foster, Secretary, Corning, N. Y.

August 20-23.
New York State Firemen's Association.—Convention, Elmira, N. Y.

September 17-19.
American Society of Municipal Improvements.—Annual convention, Detroit, Mich.—George W. Tillson, Secretary, Municipal Building, Brooklyn, N. Y.

September 19-21.
League of American Municipalities.—Annual convention, Jamestown Exposition.—John MacVicar, Secretary, Des Moines, Ill.

October 8-11.
International Association of Fire Engineers.—Thirty-fifth Annual Convention, Washington, D. C.

October 14-18.
American Street and Interurban Railway Association.—Annual convention, Atlantic City, N. J.—B. V. Swenson, Secretary, Engineering Societies Building, 33 West Thirty-ninth street, New York.

November 19.
National Municipal League.—Annual convention, Providence, R. I. (in conjunction with the American Civic Association).—Charles Y. Bonaparte, Secretary.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Buildings, Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we can not guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Street Improvements				
New York	New York	May 2, 11 A.M.	Asphalt block paving, grading, etc. Bronx	Louis F. Haffen, Boro Pres.
Virginia	Petersburg	May 2, 4 P.M.	Paving 26,000 sq. yds.; granite blocks or asphalt on sand and vit. block on concrete base	R. D. Budd, City Engineer.
Ohio	Cincinnati	May 3, noon	Grading, setting 3,920 ft. granite curb, granite paving 10,300 sq. yds. Harrison Ave	C. N. Danenhower, Ch. Eng'r. B.P.S.
North Carolina	Lexington	May 3, 4 P.M.	Macadamizing 38,000 sq. ft., 13,000 lin. ft. brick or cement gutter, 15,000 ft. granite or cement curb, etc	Gilbert C. White, Durham, Eng'r.
Pennsylvania	Franklin	May 3	Paving and curbing 4 streets 1 mile	Phil Engelskirger, City Clerk.
Ohio	Painesville	May 3	Constructing State highway	Sam. Huston, Columbus, Com'r.
Ohio	Cincinnati	May 3	Paving, curbing, etc., 2 streets	M. J. Keefe, Clk., Bd. Pub.Serv.
Massachusetts	Boston	May 4, 11 A.M.	Brick and granite paving at navy yard	Commanding Officer.
Indiana	Jeffersonville	May 4, noon	Grading, draining, paving crushed stone or other material 41 miles, on 9 roads	George B. Parks, Co. Auditor.
Ohio	Lorain	May 4, noon	Paving four streets	J. B. Nichols, City Engineer.
Ohio	Woodsfield	May 4	Paving with brick and sewering two streets	George P. Dorr, Village Clerk.
Indiana	New Albany	May 4	Brick roadway, cement curb and gutter, 1 st $3.50 ft	Sam. T. Mann, City Engineer.
Wisconsin	Oshkosh	May 4	Lay brick and asphalt, etc., 3 sts	W. A. Marden, Chm. Bd. Pub. Wks.
Ohio	Chagrin Falls	May 4	Grading, curbing and paving, 4-in. brick, 2 sts.	W. P. Rice, Eng. Co., Cleveland.
New York	White Plains	May 6, 8 P.M.	Furnishing and laying 2,000 sq. yds. block pavement on two streets	John J. Brown, Village President
New Jersey	Orange	May 6, 8 P.M.	Laying flag sidewalks in two streets	F. T. Crane, City Engineer.
Iowa	Carroll	May 6	Laying 1,200 yds. brick on 6-in. concrete base	J. A. Dougherty, City Clerk.
Washington	Vancouver Barracks	May 6	Constructing cement walks, curbs, steps, etc.	Constructing Quartermaster.
North Dakota	Fargo	May 6	Paving creosoted or cedar block on concrete	N. C. Morgan, City Clerk.
Indiana	Salem	May 6	Constructing gravel road, Vernon twp	Sam. G. Ellis, County Auditor.
Ohio	Ashland	May 6	Paving, curbing, etc., 2 sts., 17,000 sq. yds	A. P. Black, Clk., Bd. Pub. Serv.
Indiana	Brazil	May 7, 11:30 A.M.	Building 23 miles gravel roads, Harrison twp.	Jas. L. Burns, Co. Auditor.
Indiana	Vincennes	May 7, 2 P.M.	Building 9,332 ft. gravel road, Widner twp	John T. Scott, Co. Auditor.
Pennsylvania	McKeesport	May 7, 4 P.M.	Repaving 2 sts. with vit. brick	C. E. Soles, City Comptroller.
New York	Cohoes	May 7, 8 P.M.	Paving and curbing alley	Chas. H. Van Auken, City Engineer.
New Jersey	Trenton	May 7, 8 P.M.	Laying brick, granite and flagstone sidewalks, and curbs and gutters; repairing asphalt sts.	Harry B. Salter, City Clerk.
Ohio	Columbus	May 7	Paving, etc., 4 sts.; asphalt, brick or block	Eduard F. McGuire, Sec'y, B. P. S.
Wisconsin	Dodgeville	May 7	Laying 40,000 sq. ft. cement walk; also curb and gutter	The Mayor.
New Jersey	Bayonne	May 7	Paving 6,700 yds. macadam; 5,640 yds. brick, 4,640 yds. asphalt	Pierre Garvin, Mayor.
Wisconsin	Madison	May 7	Macadamizing, etc., 10 miles sts.; cost, $100,000	John F. Icke, City Engineer.
New Jersey	Ridgewood	May 7	Grading and macadamizing 80,000 to 100,000 sq yds	John J. Launier, Pres. V. I. Trus.
Indiana	New Castle	May 7	Laying bitulithic and cement walks	Eugene McDowell, City Engineer.
Missouri	St. Louis	May 7	Paving with asphalt and brick	A. J. O'Reilly, Pres. B. P. Imp.
New Jersey	Trenton	May 7	Repairing asphalt streets	Harry B. Salter, City Clerk.
Ohio	Cleveland Heights	May 7	Laying sidewalk on Fairmount Boulevard	W. G. Phare, Village Clerk.
Louisiana	Alexandria	May 7	Paving Fourth St. with asphalt	F. S. Hoyt. City Engineer.
Indiana	Orleans	May 8, 2 P.M.	Building 2 roads, 21,090 ft. long	County Commissioners.
Wisconsin	Chippewa Falls	May 8, 2 P.M.	Paving Central Ave with brick	George McCall, Clk. Bd. Pub. Wks.
Iowa	Des Moines	May 8	Laying creosoted wood blocks, curb, etc	W. W. Wise, Clk., Bd. Pub. Wks.
Indiana	Winchester	May 8	Paving 4 sts., brick on 5-in. concrete base	Samuel B. Fox, City Clerk.
Indiana	Winchester	May 9, 1 P.M.	Constructing 27 miles, crushed stone, 12 roads	Mack Pogue, County Auditor.
Ohio	Jefferson	May 9	Constructing State highway	Sam Huston, Columbus, Com'r.
Indiana	Indianapolis	May 9	Improving about ten highways	Mack Pogue, Co. Auditor.
Ohio	Cincinnati	May 10	Improving three roads	Fred Dreihs, Clerk Co. Com'rs
Ohio	Cincinnati	May 10	Laying macadam, curb, etc., 2 sts., cost, $11800	M. J. Keefe, Clk. Bd. Pub. Serv
Indiana	Galesburg	May 10	Building 15,000 ft. macadam road; also another road	Frank E. Ryan, County Auditor.
Kentucky	Danville	May 10	Improving turnpikes in County	John Fogarty, Fiscal Court.
Ohio	Columbus	May 10	Paving bridges, grading approaches, etc	W. C. Cussins, Co. Auditor.
Indiana	Terre Haute	May 11, 11 A.M.	Grading, graveling, etc., 12,552 ft. road	County Commissioners.
Oklahoma	Lawton	May 11	Paving, sewers, etc.; cost, $260,000	John D. Kennard, Engineer.
Indiana	Peru	May 11	Paving Water St. with brick	Michael Horan, City Engineer.
Kentucky	Louisville	May 12	Paving 15 blks. with brk., requiring 1,350,000.	J. P. Claybrook, City Engineer
New Jersey	Bernardsville	May 13	Macadamizing 5,450 ft. of road	Antony Schumacher, Engineer.
Minnesota	Crookston	May 14, 8 P.M.	Asphalt paving 10,000 sq. yds., curb and tile, Houston Ave	J. F. Carroll, City Engineer.
Ohio	Chardon	May 14	Paving with brick and curbing S. Main St.	Robt. S. Parks, Village Clerk.
Mississippi	Natchez	May 15, 5 P.M.	Paving 22,500 sq. yds. asphalt, bitumen or brick	The Mayor
West Virginia	Bluefield	May 16, 2 P.M.	Macadam and brick on concrete base	George H. Hill, City Engineer.
Kentucky	Louisville	May 18	Paving streets with asphalt; cost, $40,000	J. P. Claybrook, City Engineer
Ohio	Cleveland	May 18	Grading, draining, paving Northfield road	A. B. Lea, County Surveyor.
Ohio	Plymouth	May 21	Macadamizing and piking 4 miles of road	Albert Kirkpatrick, Village Clerk.
Ohio	Creston	May 22	Brick paving, curb, etc., Main St	C. A. Tenney, Village Clerk.
Indiana	Jasper	June 8	Constructing road 2 miles long	M. A. Sweeney, County Auditor
Water Supply				
Pennsylvania	Philadelphia	May 2, noon	Completing Torresdale pumping station and Court No. 3 at Filter plant	J. R. Hathaway, Dir. P. W.
Oregon	Astoria	May 2, 2 P.M.	Constructing storage reservoir dam, 1,000,000,000 or 220,000,000-gal. 3 sets plans, cost. $55,000, $75,000 and $90,000	G. W. Lounsberry, Clk. Water Com'r.
North Dakota	Waupeton	May 2, 2 P.M.	Artesian well at Indian School	James C. Clifford, Superintendent.
Ohio	Middletown	May 2	Furnishing 20 tons 6-in., 4 tons 4-in. c. i. pipe and specials	N. G. Ogelsby, Clerk.
Hawaii	Honolulu	May 3	Constructing pumping station and 300,000-gal. reservoir, at new military post	J. B. Bellinger, San Francisco, Q. M.

Water Supply—*Continued*

Minnesota	Zumbro Falls	May 3	Constructing waterworks, inc. concrete reservoir, pipe line, brick pump house, gasoline engine, pump and well	Oscar Claussen, St. Paul, Eng'r.
Montana	Forsyth	May 3	Constructing waterworks plant; cost, $40,000.	Iowa Engineering Co., Clinton, Ia.
Florida	Pensacola	May 4, 11 A.M.	Furnishing boilers, etc., at navy yard	Commanding Officer.
New York	Carthage	May 6, noon	Constructing 12-in. conduit line 14 2-3 miles long intake, reservoir, dam, gatehouse	Eaton & Brownell, Engineers.
New York	Albany	May 6, 3 P.M.	Preliminary filters, inc. 16 rein. conc. filter tanks, each 54 x 18 ft. with gallery, pumping station and appurtenances	Wallace Greenalch, Eng'r and Supt.
Florida	Jacksonville	May 6	Sinking 10-in. artesian well, 980 ft. and casing to depth of 500 ft	R. N. Ellis, Supt. Waterworks.
Minnesota	Hastings	May 6	Constructing water mains in six streets	Chas. Hankes, City Clerk.
Ohio	Wauseon	May 6	Constructing 104,000-gal. reservoir	E. H. Harrison, Sec'y Bd. Trustees.
Indian Territory	Madill	May 7	Furnishing pipe, hydrants, valves, tanks and tower, boilers, feedwater heater, duplex pumps, boiler-feed pumps, deep-well pumps, cement, brick, etc., for complete waterworks system	O'Neil Engineering Co., Dallas, Tex.
Ohio	Cincinnati	May 7	Concrete floor in pump pit, completing two valve chambers, and electri'l hoist in shaft.	Elmer G. Prior, Clk. Com'r W. W.
Mississippi	Columbus	May 7	Laying 2½ miles 6 and 8-in. water mains	Kirkpatrick & Johnson, Jackson, Eng.
District of Columbia	Washington	May 8, 2 P.M.	Pipe fittings and valves for Nat'l Museum building	Bernard R. Green, Supt. Construct'n.
New York	Waterville	May 13, 7 P.M.	Constructing 25,000,000-gal. reservoir, and pipe line, con. with water system	Earl Conger, Clk. Water Com'rs.
Connecticut	New Britain	May 15	Building intake at Burlington; cost, $300,000	P. M. Blake, Newtonville, Mass.
Texas	Galveston	May 16, noon	Taking out and replacing 30 strainers	C. G. Wells, City Engineer.
Manitoba	Brandon	May 17, 4 P.M.	Supplying 85 tons 6 and 8-in. c. i. pipe and specials	W. H. Shillinglaw, City Engineer.
Texas	Fort Bliss	June 3, noon	Sinking 12-in. tubular well; installing pump; 150,000-gal. steel tank on 70 ft. trestle, two 40-h. p. boilers	Constructing Quartermaster.
New Jersey	Burlington	June 5, 3 P.M.	Constructing mechanical filter plant, capacity 3,000,000 gals. per day	George A. Allinson, Superintendent.
West Virginia	Romney	June 19	Constructing new water and sewer system, School for Blind; cost, $13,000	Superintendent.

Sewerage

Pennsylvania	Scranton	May 2, 10:30 A.M.	Constructing lateral sewer, Wheeler Ave	C. R. Acker, Dir. Pub. Works.
Arizona	Whipple Barracks	May 2, 3 P.M.	Extending post sewer	Chas. C. Walcott, Capt. & A. Q. M.
New York	North Olean	May 2, 7:30 P.M.	Sewerage system and two treatment works	Knight & Hopkins, Rome, Eng'rs.
Virginia	Suffolk	May 2	Constructing 8-in. vit. sewer in Smith St.	Dr. H. W. Campbell, Chm. Sewer Cm.
Ohio	Cincinnati	May 3, noon	Constructing sewers in two streets	M. J. Keefe, Clk. Bd. Pub. Serv.
Georgia	Sandersville	May 3, 3 P.M.	Constructing 6 miles 8-15 in. sewers, etc	D. L. Cheatham, Mayor.
New York	Bronxville	May 3, 8:30 P.M.	Constructing additions to sewer system	G. H. Rodgers, 2543 Third Ave., N.Y.
New York	Utica	May 3	Constructing stormwater drain, Pleasant St.	J. A. Cantwell, City Clerk.
Ohio	Chillicothe	May 3	Sanitary sewer, 8-in., inlets, etc., Church St	H. T. Hermann, Clk. Bd. Pub. Serv.
Indiana	Elkhart	May 4, 10 A.M.	Constructing Ninth Dist. sewer, cost, $18,059.89 and Tenth Dist. sewer, $72,093.45	A. M. Smith, City Engineer.
Alabama	Montgomery	May 6, noon	Laying sewer pipe, manholes, etc., 8 streets	R. S. Williams, City Treasurer.
New Jersey	Orange	May 6, 8 P.M.	Laying 2,200 ft 8-in. vit. pipe sewer, etc	F. T. Crane, City Engineer.
New York	Binghamton	May 6, 8 P.M.	Constructing Fourth Ward trunk sewer	D. C. Herrick, City Clerk.
Minnesota	Hastings	May 6	Constructing sewers in six streets	Chas. Hankes, City Clerk.
New Jersey	Trenton	May 7, 8 P.M.	Constructing sewers in 3 streets	Harry B. Salter, City Clerk.
New Jersey	Summit	May 7, 8:30 P.M.	Constructing pumping station trunk sewer	Alex. Potter, N. Y. City Con. Eng'r.
Indiana	Richmond	May 8, 10 A.M.	Sewerage system and disposal plant; cost, $48,000	Fred R. Charles, City Engineer.
New York	Brooklyn	May 8, 11 A.M.	Constructing sewers and sewer basins	Bird S. Coler, Boro Pres.
Idaho	Boise	May 8, 11 A.M.	Constructing sewer system, Boise barracks	R. B. Turner, Q. M.
Pennsylvania	McKeesport	May 9, 4 P.M.	Constructing 15-24-26-in. terra cotta sewers	C. E. Soles, City Comptroller.
Colorado	Lamar	May 9, 8 P.M.	Constructing sanitary sewer system, requiring 66,805 ft. 8, 12, 15, 18 and 21-in. vit. pipe sewer	C. W. Heaton, Town Clerk.
Ohio	Cincinnati	May 9	Building sewers and drains in Eduards road	M. J. Keefe, Clk. Bd. Pub. Serv
Wisconsin	Madison	May 10	Three miles 6 to 10-in sanitary sewers; cost, $15,000	John F. Icke, City Engineer.
Oklahoma	Lawton	May 11	Laying brick and pipe sewers, etc.; cost, $260,000	John D. Kennard, Engineer.
District of Columbia	Washington	May 13, noon	Constructing sewer	H. B. F. Macfarland, Commissioner
Maryland	Baltimore	May 15, 11 A.M.	Constructing storm water drains; cont. 2 & 3.	Benj. T. Fendall, City Engineer.
Ohio	Groveport	May 15	Furnishing labor for sewering Joppy ditch	B. L. Pier, Village Clerk.
Texas	Waco	May 16	Constructing 15 miles central sewer exten	R. B. Dickey, City Secretary.

Public Buildings

Kansas	Wellington	May 4, 5 P.M.	Constructing a city building	U. G. Charles, Wichita, Architect.
Louisiana	Winnsboro	May 5	Erecting a high school	J. T. Snyder, Shreveport, Architect.
New York	New York	May 6, 11 A.M.	Repairs, alterations, etc., 12 school buildings.	C. B. J. Snyder, Superintendent.
New Jersey	Trenton	May 6, 3 P.M.	Building complete, extension Federal Bldg	J. K. Taylor, Washington, D. C.
Missouri	Potosi	May 6	Erecting $30,000 Court House	County Clerk.
Mississippi	Ellisville	May 6	Erecting 2 Court Houses; cost, $60,000 each; one in Laurel, other replace present	P. J. Krouse, Meridian, Architect.
Indiana	Laurenceburg	May 6	Extensions and repairs to County jail	Board County Commissioners.
Mississippi	Booneville	May 6	Constructing cells for new jail	B. McCullar, Clk., Co. Supervisors.
Ohio	Youngstown	May 6	Erecting 8-room brick and stone school; cost, $40,000	John G. Morgan, Pres. Bd. Educ.
Indiana	Rockville	May 7, 1 P.M.	Constructing a County Asylum	Park County Commissioners.
Idaho	Rossfork	May 7, 2 P.M.	Erecting stone dormitory and hospital	A. F. Caldwell, Supt. School.
Indiana	Lafayette	May 7, 3 P.M.	Bldg. complete. extension Federal Bldg	J. K. Taylor, Washington, D. C.
Mississippi	Amory	May 7	Erecting a 2-story brick school	A. E. Hindsmon, Tupelo, Arch.
Indiana	Kokomo	May 8	Erecting hospital at County Infirmary	W. L. Benson, County Auditor.
Massachusetts	Salem	May 9	Erecting 2-story fire-proof granite bldg. for Registry of Deeds; cost, $300,000; equipment, $100,000	Clarence Blackall, Boston, Arch.
California	Santa Rosa	May 11	Erecting $295,000 Court House	Board of Supervisors.
Wisconsin	Oshkosh	May 11	Erecting addition to Read school	W. A. Marden, Chm. Bd. Pub. Wks.
Iowa	Davenport	May 13, 2 P.M.	Erecting new hose house, Rockingham road	Hugo Moeller, City Clerk.
Pennsylvania	Philadelphia	May 13, 3 P.M.	Installing high-pressure steam boiler plant and accessories, U. S. Court House and P.O.	J. K. Taylor, Washington, D. C.
Ohio	Mt. Vernon	May 14	Erecting administration building, power house, etc, State Sanatorium; cost, $175,000	Frank L. Packard, Columbus, Arch.
Colorado	Denver	May 15, 3 P.M.	Extension, etc., Federal Building	J. K. Taylor, Washington, D. C.
California	San Jose	May 15	Building $175,000 school, four to cost $50,000 and one to cost $20,000	F. S. Allen, Pasadena, Architect.
Missouri	Maryville	May 15	Erecting main bldg. Normal School; cost, $225,000	Geo. P. Stoptaugh, Elmo, Sec'y Board of Regents.
Alabama	Tuscaloosa	May 15	Erecting $70,000 or $75,000 Court House	W. E. Spink, Birmingham, Architect
Georgia	Fort Screven	May 15	Erecting several buildings	Col. Dan C. Kingman, Corps Eng'rs.
Montana	Lewistown	May 15	Erecting $100,000 fire-proof Court House	Julius Petersen, Chm., Co. Com'rs.
North Carolina	Newbern	May 16	Erecting County jail	C. E. Foy, Chm. Co. Com'rs.
Missouri	Maryville	May 16	Erecting State Normal School	Geo. P. Stoptaugh, Elmo, Sec.B d. R.
Washington	Tacoma	May 30	Erecting 2-story fire engine house	Owen Woods, Com'r Public Works.
South Dakota	Pierre	June 4	Constructing Capitol bldg.; cost $600,000	Bell & Detweiler, Northwestern Bldg. Minneapolis, Minn., Archs.

Bridges

New York	Buffalo	May 2, 11 A.M.	Erecting plate girder bridge, 35 ft. wide, 74-ft. span on pile and masonry foundation, across Slip No. 1, River St.	Chas. M. Morse, Dept. Eng'r Com'r.
Ohio	Zanesville	May 2.	Constructing five small bridges	Board County Commissioners.
Wisconsin	Milwaukee	May 4, 10 A.M.	Concrete-steel archviaduct, Melan system	Concrete-Steel Eng. Co., N Y C
Ohio	Cleveland	May 4, 11 A.M.	Building 3 concrete abutments	A. B. Lea, County Surveyor.
North Dakota	Forman	May 6, 10 A.M.	Erecting 2 steel bridges; one 30 ft. long	R. P. Irving, County Auditor.
Kansas	Leavenworth	May 6, noon.	Constructing concrete culvert	J. W. Niehaus, County Clerk.
Ohio	Elyria	May 6, noon.	Constructing 2 stone bridges	C. M. Theobald, City Engineer.
Indiana	Tipton	May 6, 2:30 P.M.	Erecting new span, repairs, etc., Louck's bridge	J. F. Barlow, County Auditor.
Indiana	Knox	May 6.	Building 30-ft. steel also concrete bridge	Lee M. Ransbottom, Co. Auditor.
Indiana	Greensburg	May 6.	Constructing bridge	F. E. Ryan, County Auditor.
Indiana	Lagrange	May 7, noon.	Erecting 20-ft. iron bridge, 16 ft. wide, two concrete arches 6 x 16 and 10 x 16, concrete abutments	V. D. Weaver, County Auditor.
Indiana	Covington	May 7, noon.	Building 21-ft. span concrete bridge, approaches to 30-ft. steel bridge, 8-ft. concrete arch, concrete abutments	W. B. La Baw, County Surveyor.
California	San Andreas	May 7, 1 P.M.	Erecting 160-ft. steel span, concrete piers	A. W. Poe, County Clerk.
Indiana	Princeton	May 7, 2 P.M.	Moving and bldg. bridge over Richland Creek	Gibson County Commissioners.
Indiana	Kokomo	May 8, 11 A.M.	Erecting 2 rein. concrete bridges	Wm. L. Benson, County Auditor.
Indiana	Logansport	May 8, 2 P.M.	Steel bridge, concrete floor and abutments	Auditor, Cass County.
Ohio	Coshocton	May 8.	Bldg. 165-ft. steel bridge, 50-ft. automatic swing bridge, 40-ft. span bridge, 3 twps.	George J. Bock, Jr., Co. Surveyor.
Wisconsin	Milwaukee	May 10, 10:30 A.M.	Erecting bascule bridge over canal as section of First and Sixth Ave. viaduct	Paul Bechtner, Comptroller.
Ohio	Sandusky	May 10, 1 P.M.	Erecting steel span, 131 ft. 6-in., also rebuilding stone abutments, 2 bridges	J. N. Traxler, County Auditor.
Ohio	Columbus	May 10.	Building Leonard Ave. viaduct, etc.	W. C. Cussins, Co. Auditor.
Ohio	Lorain	May, 13.	Erecting Ashenbach culvert	Chas. Chandler, Clk. Co. Com'rs.
Ohio	Bryan	May 14, 10 A.M.	Building 3 bridges: 14 x 50 ft., cost, $1,203.13; 16 x 28 ft, $1,281.57; 14 x 34 ft., $1,370.88.	Jeremiah Clay, County Com'r.
District of Columbia	Washington	May 15, 2 P.M.	Furnishing metal work for two 60-ft. span steel bridges, f. o. b. cars, at mfrs. shipping point.	J. R. Garfield, Sec'y U. S. Recl. Serv
Indiana	South Bend	May 20.	Concrete box culvert 16 x 80 ft.	A. J. Hammond, Engineer.
Missouri	St. Louis	May 21, noon.	Removing superstructure and erecting new steel one 18th St. bridge; also laying concrete and wood block pavement on same.	A. J. O'Reilly, Pres. B. P. I.
South Dakota	Castlewood	May 21, 2 P.M.	Erecting 5 steel bridges: 60, 50, 40, 20, and 16 ft. on steel piles, with wing walls.	Wm. Marshall, County Auditor.
Florida	Pensacola	June 4, 7:30 P.M.	Bldg. steel bridge across Little Bayou	A. M. McMillan, Clk. Co. Com'rs.

Miscellaneous

Iowa	Des Moines	May 2, 11 A.M.	Improving channels, Raccoon and Des Moines Rivers	W. W Wise, Bd Pub. Works.
Utah	Salt Lake City	May 3, 8 P.M.	Extension to garbage crematory	Louis C. Kelsey, City Engineer.
Florida	Pensacola	May 4, 11 A.M.	Installing boiler room machinery for Central power plant U. S. Navy Yard; cost, $45,000	C. R. Hollyday, Chief, Bureau Yards and Docks, Navy Dept, Washington, D. C.
New York	Rochester	May 6, noon.	Erecting 7 steel flag poles on schools	J. Foster, Warner, Architect.
District of Columbia	Washington	May 6, 2 P.M.	Furnishing brass and iron castings	Thos. J. Sullivan, Dir. B. E. & P.
New York	Albany	May 6, 3 P.M.	Erecting $45,000 bldg. Public Bath No. 3	Isidore Wachsman, Clk., Bd. C. & S.
California	Mare Island	May 7, 10 A.M.	Furnishing 2 duplex air compressors, power brake, portable oil fuel burner, etc.	Bureau of Supplies and Accounts, Navy Dept., Washington, D. C.
New York	Rome	May 7.	Lighting the city.	H. C. Midlam, Clk., Bd. Pub. Works.
New York	West New Brighton	May 7.	Reinforced concrete foundations, runway, con. flue and chimney of refuse destructor.	Geo. Cromwell, Boro. President.
District of Columbia	Washington	May 8, noon.	Building 2 subways to connect Capitol with Senate and House Office buildings	Elliott Woods, Supt. U. S. Capitol.
Saskatchewan	Battleford	May 10, 5 P.M.	Installing electric lighting system	Galt & Smith, Toronto, Con. Eng'rs.
New York	New York	May 14, noon.	Building Route No. 9 of subway, 4 tracks.	Rapid Transit Commissioners.
California	Los Angeles	May 20, 2 P.M.	Constructing boilers, engines, generators and motors for 1250-h.p. to Aqueduct Cement Works	Horace B. Ferris, Sec'y Bd. Pub. Works.
Illinois	Chicago	May 29, noon.	Generators, transformers, etc., Sanitary Dist.	L. J. Bryan, Clk., Am. Tr. Bldg.
New York	Fort Wood	June 1.	Electric light fixtures in post	G. C. Burnell, Constr. Q. M.
Illinois	Chicago	June 5, noon.	Excavating and building docks	R. R. McCormick, Pres. San't'y Dist.
Indiana	Fort Wayne	June 12.	Building $160,000 electric-light plant; two 300 kw. turbine units or 3 250 kw. engine, type a. c. generators; 420 arc lamps	Owen Ford, St. Louis, Mo., Eng'r.
Georgia	Elberton	July 15.	Constructing electric power plant, operated by steam, 108 kw. alternator and exciter, 150 h.p. engine	G. W. Hubbard, Superintendent.

STREET IMPROVEMENTS

Decatur, Ala.—Council has decided to pave 5,000 lineal feet of streets and to lay sidewalks.

Huntersville, Ala.—An ordinance has been passed for paving several streets with brick; estimated cost, $13,000.

West End, Ala.—Considerable street and sidewalk, as well as sewer, improvements will be made this year.—Address Mayor Norwood.

Little Rock, Ark.—The County Board and the City Council are arranging to improve Terre Haute street by paving.

New Haven, Conn.—Bids will be received, June 1, for the purchase of $172,000 street improvement bonds.

Wilmington, Del.—The Street and Sewer Department is planning to pave 137 blocks of streets when the $500,000 loan is secured; the improvements will cost $416,000.

The New Castle County Levy Court has decided to issue $300,000 bonds for road improvement purposes.

Waycross, Ga.—Council is preparing to pave 12,000 square yards with vitrified brick; cost, $20,000.—C. J. Thomas, City Engineer.

Bloomington, Ill.—Plans will be prepared for paving several streets, at a cost of $34,000.

East St. Louis, Ill.—A sidewalk ordinance has been introduced in the City Council requiring that granitoid walks be laid on the following streets: Collinsville avenue, Missouri avenue, Broadway, Main, State street, St. Clair avenue, St. Louis avenue, Fifth, Sixth, Seventh, Ninth and Tenth streets.

Greenfield, Ind.—Council has decided to improve a large number of streets and to construct several miles of cement curbing and sidewalks.

Kokomo, Ind.—Sycamore street will be paved with asphalt.

Nappanee, Ind.—The city will soon invite bids for paving two miles of streets.

Princeton, Ind.—Council is arranging to pave many streets with brick.

Westfield, Ind.—Bids are invited for paving a mile and a half of streets.—T. T. Bray, Clerk, Town Board.

Hopkinsville, Ky.—The citizens have voted $100,000 bonds for improving county roads.

Louisville, Ky.—The Board of Public Service of New Albany has accepted a report of City Engineer Samuel T. Mann for the improvement of Thomas street, the cost of which will be $3.50 per lineal foot; total cost of the improvement, $5,500; specifications call for a brick roadway and cement curb.

Mayfield, Ky.—The Fiscal Court of the county has volunteered to lay concrete pavements and vitrify the streets around the Court House Square; this will be followed by a large amount of paving in other sections of the town.

Haverhill, Mass.—The improvement of Merrimac street, the principal thoroughfare, is being considered; this will probably necessitate abandonment of all other permanent work during the year. —Roswell L. Wood, Mayor; Robert R. Evans, City Engineer.

Grand Rapids, Mich.—Portions of Alexander avenue and East Bridge street will be paved, at a cost of $58,175.

Houghton, Mich.—The village of Larium states that that village will employ an engineer to prepare plans and specifications for a large amount of paving to be done the coming summer; it is estimated that 1,860 square feet will be laid; either brick or granitoid will be used.—Wm. Oates, City Solicitor.

Lancaster, Minn.—Bonds, $30,000, have been voted for building roads and bridges.

Omaha, Neb.—The Board of Public Works will conduct a boulevard three and a half miles long.

Concord, N. H.—The route for the new Merrimac road has been selected; $60,000 will be spent by the State and towns in the improvement.

Cortland, N. Y.—Groton avenue will be

paved with slag or macadam from Otter creek to the city line.—Coleman, City Engineer.

Dunkirk, N. Y.—The Common Council has decided to advertise for bids for paving Front and Lake streets from Lion to Ocelot streets.

Rochester, N. Y.—Wilger street will be paved, cost $14,000; Lake avenue, cost $90,000; Dewey avenue, cost $45,000; Western avenue, $25,000; Leighton avenue, Barnum and Couch streets, cost $19,000.

Schenectady, N. Y.—Council has passed ordinances for grading, paving and curbing Division, McClellan and Emmett streets, and Osterbitz avenue; the improvement of many other streets is being considered.—Mayor Clute.

Akron, O.—The City Clerk is about to advertise for bids for improving Cuya street and Marvin avenue.

Akron, O.—City Engineer Paine is preparing plans and estimates for the improvement of Bluff and Arch streets.

Ashtabula, O.—An ordinance to pave Walnut, Elm, East Fisk, Tyler avenue, together with the setting of combination cement curb and gutter, has passed Council; asphalt block and vitrified brick are to be used; a large number of sidewalks were also authorized.

Bucyrus, O.—Contractor E. A. Freshwater, who has the contract for the Charles street improvement, at $28,000, will use Metropolitan brick.

Cambridge, O.—Resolutions have passed to pave Madison avenue and for considerable other paving on the South Side; plans will be prepared at once and bids invited at an early date.

Cincinnati, O.—The Board of Public Service has authorized repairs on about twenty streets and avenues.—M. J. Keefe, Clerk, Board of Public Service.

Celina, O.—West Market street will be paved; cost, $28,000.

Clyde, O.—Railroad street will soon be paved.

Columbiana, O.—Plans are being prepared for 20,000 square yards of brick.

Dayton, O.—The City Engineer recommends an issue of $25,000 bonds for establishing an asphalt plant.

Findlay, O.—Hall & Son have the contract for paving Howard street, at $9,552. Massillon brick will be used.

Fostoria, O.—The resolution to pave Columbus avenue by macadamizing has passed its third reading.

Lima, O.—Contracts will be awarded in a couple of days for the paving of five new streets in which both brick and asphalt are to be used; the successful contractors appear to be Murray & Jameson, E. A. Freshwater & Son and Val Heil.

Lima, O.—The Board of Public Service has decided to advertise for bids for paving Penfield avenue and other streets; the construction will amount to nearly $200,000.

Lorain, O.—Council has authorized the paving of Reid street from Franklin to Fifth avenue.

Marion, O.—South Prospect street will be paved.

Newark, O.—Councilman McNealey has presented a petition for twenty property owners from North Fourth street asking that that street be paved and curbed, and the Council will probably take favorable action on the request; the improvement of half a dozen other streets by paving, draining and sewering has been authorized.

New Bremen, O.—Council has decided to pave six blocks the coming summer; Engineer Fishbaugh will make the necessary plans and specifications at once.

New Philadelphia, O.—Clyde Kneisely, City Engineer, has submitted plans and specifications for a large amount of paving on the South Side, calling for 2,545 feet of roadway 36 feet wide and banked with cement curb; a 3-inch gravel base, a 2-inch sand cushion, and paving block, are recommended, costing $17,500.

New Philadelphia, O.—City Engineer Kneisely is preparing plans for the grading and paving of South Broadway from the river bridge to the south corporation line; the paving will be 2,545 feet long, and will contain 10,600 square yards of brick, which will be the standard paving block; there shall be either cement or gravel foundation covered with 1½ inches of sand with tar filler.

Norwalk, O.—The contemplated paving on Woodlawn avenue is probably to be extended to the cemetery.

Oberlin, O.—The town will vote, May 21, on the proposition to bond the town for $16,000 for constructing brick and asphalt pavements and $10,000 for constructing new sewer beds, according to plans of Engineer Gerrish.

Portsmouth, O.—Gray street will be paved with vitrified brick.

Sandusky, O.—Lawrence avenue will be paved with brick; cost, $10,000.

Steubenville, O.—Council is preparing to pave several streets.

Wadsworth, O.—Council is arranging to pave several streets, at a cost of $44,000.

Wauseon, O.—Plans and specifications are being prepared for paving Depot street.

Zanesville, O.—Plans are being prepared for paving Eastern avenue and Jackson street with brick block.

Woodville, Ore.—Council has decided to pave certain streets.

Freeport, Pa.—Bids will soon be asked for grading, curbing, etc.—Address Borough Engineer.

Meadville, Pa.—Council will pave the intersection of Clarke avenue and Randolph street with asphalt block.

Newbern, Tenn.—Bonds, $25,000, have been voted for school house and $25,000 for paving streets.

Alexandria, Va.—Council Committee on Streets and Finance is considering appropriation of $14,000 for the improvement of Washington street between Queen and Wythe street, and $1,950 for improving Princess street between Lee and Union streets; $625 has been appropriated for improving the roadway of Prince street and $1,500 for laying sewer in Washington street.—Mayor Paff.

Columbia, Wash.—Caldwell, Hudson, Winston and Americus streets will be graded, planked and sidewalks built, at a cost of $40,000.

Bluefield, W. Va.—The city is advertising for bids for paving a large number of streets, the total cost of which will be $75,000.

Union, W. Va.—There is a petition in circulation in Monroe County asking for the submission to the voters of $100,000 bond issue for macadamizing the principal roads of the county.

SEWERAGE

Bakersfield, Cal.—Plans are being prepared for the construction of a sewage disposal septic tank; cost, $120,000.—J. L. Evans, City Engineer; A. T. Lightner, City Clerk.

Truckee, Cal.—An election has been called to vote on the question of issuing bonds for complete sewer system.

Wilmington, Del.—Arrangements are being made to install sewers and pave 145 blocks of streets, according to plans and specifications; these improvements are estimated to cost $416,000.

Commerce, Ga.—An election will be held to decide the question of issuing $45,000 sewer and water bonds.

Hoopeston, Ill.—Plans and estimates are being prepared for a sewer system.

La Grange, Ill.—An ordinance has been passed by the villages of La Grange and Rosedale for the erection of a box sewer to drain the two towns in Salt creek; bids have not yet been asked for, but it is expected that work will be commenced June 1; cost, $115,000.

Pana, Ill.—Plans are being prepared by the Board of Public Works for a sewer system extending in the south and west portions of the city; cost, $40,000.

Des Moines, Ia.—Plans are being prepared for the construction of the Ingersoll sewer, to cost $60,000.

Latonia, Ky.—Arrangements are being made to construct trunk sewers in several streets.

Lexington, Ky.—The Fitzgerald Plumbing Company is the low bidder for the construction of a sewer on South Limestone street and has the contract.

Louisville, Ky.—The Board of Public Works will receive bids, until May 12, for constructing fifteen blocks of streets, to be paved.

Detroit, Mich.—The Board of Aldermen have authorized Robert McCormick, City Engineer, to prepare estimates for a sewer for Fairview, to extend from Connors creek to the Jefferson avenue sewer; cost, $500,000.

Minneapolis, Minn.—Bids will be received, May 9, for the purchase of $100,000 sewer bonds; interest, 4½ per cent.—Dan C. Brown, City Comptroller.

Charleston, Mo.—Plans are being prepared for the construction of a sewage disposal plant; cost, $15,000.—Address City Clerk.

Lancaster, N. Y.—Bonds have been issued amounting to $150,000 for a sewer system.

Olean, N. Y.—The village of North Olean has voted to install a sewer system, to cost $60,000.—John Degnan, Village President.

Akron, O.—The Engineer is preparing plans for sewers in Berry avenue, Gets street, Halsted street and Ira avenue.

Alliance, O.—The question of constructing an adequate sanitary sewer system is about to be presented to the State Board of Health.

Ashland, O.—Chairman Sweinford of Council Committee on Sewers, states that a sewer will be extended to the Evergreen Hamlet addition.

Ashtabula, O.—Council has directed that estimates be prepared for sewers for the southern suburbs of the city.

Ashtabula, O.—Plans for the new West End sewer district will be changed to provide for territory which will later be annexed.

Barberton, O.—The construction of main and storm sewers in Districts No. 1 and No. 2 have passed Council under suspension of rules.

Barberton, O.—An ordinance has been passed authorizing issue of $20,000 bonds for the construction of sewers.

Celina, O.—Street Committee has been empowered to employ an engineer to make plans for a storm sewer or for a first-class sanitary sewer, as conditions may warrant.

Delaware, O.—The construction of a disposal plant, costing $32,000, has been recommended by the Board of Trustees of the Girls' Industrial Home, of which Capt. Fred Buell, of Malvern, is President.

Girard, O.—The $30,000 bond issue for completing the sewer system and the disposal plant carried.

Lorain, O.—Glover & Burke have the contract for the Linden street sewer, at $1,471; Faragher & Tandall the Bond street sewer, at $814, and Pinney & Corran the Frankfort street sewer, at $970.

Oxford, O.—D. P. Beaton, Clerk of the Council, states the resolution to issue bonds in the sum of $50,000 for sewers, sewage disposal works, flushing tunnel, drains and ditches has passed Council.—D. P. Beaton, Clerk of Council.

Springfield, O.—The Board of Public Service has recommended the construction of a sewer in Ward street; other work is being considered.—W. H. Seiverling, City Engineer.

Zanesville, O.—The Grenwood avenue sewer is to be extended from Hamlin avenue to Fox street.

El Reno, Okla.—Bonds have been voted for sewers; issue of bonds for City Hall was defeated by six votes.

Ponca City, Okla.—Bonds have been voted for sewers and waterworks.

Chester, Pa.—The laying of a 3-foot brick sewer in Market street from Fifth street to the river, and a 2-foot terra-cotta pipe from Fifth street to the railroad, to cost $9,910, is recommended by Borough Engineer Ladomus.—Chairman McClure, Sewer Committee.

Norfolk, Va.—Arrangements are being made to install a complete sewerage system in the Seventh Ward; estimated cost, $140,000.

Central City, W. Va.—Bonds, 17,500, have been voted for paving and sewerage purposes.

Colville, Wash.—Harry Bommer, City Engineer, is preparing plans and estimates for a sewer system.

WATER SUPPLY

Poteau, Ark.—A water plant will be installed at this place.—Address W. A. Campbell.

Hartford, Conn.—Engineer Peck has recommended the laying of a 10-inch water pipe in Newfield avenue, to cost $10,500; also the laying of 8 and 10-inch pipe to replace old mains, at an outlay of $30,000.—Henry Souther and Frank C. Sumner, Water commissioners.

Tallahassee, Fla.—Plans are being prepared, by direction of Council, for constructing water system.

Rockford, Ill.—The Waterworks Committee proposes to expend $16,000 extending water system.

New Albany, Ind.—C. Hegewald & Co. have the contract for the construction of the Boule dam, at $30,000.

Iowa Falls, Ia.—The water mains will be extended several thousand feet.

Oelwein, Ia.—Council is arranging to have water meters installed.

Hopkinsville, Ky.—The Fiscal Court of Christian County has authorized $100,000 bond issue, the proceeds to be used to extend the system of pipes in this county.

Shreveport, La.—A change in the water supply is necessary, owing to the nearness of the present source to the city; Major Frank M. Kerr, Chief State Engineer, is assisting the local authorities in the matter and recently made a trip up Red river to look for suitable source.

Duluth, Minn.—A bill has passed Legislature authorizing the Duluth Water and Light Company to issue bonds.

Gunnison, Miss.—Council offers for sale $5,000 6 per cent. water bonds.—W. I. Brashear, Mayor.

Centralia, Mo.—Bids will be received, May 7, for the purchase of $55,000 4½ per cent. water and light bonds.—R. P. Price, City Clerk.

Mitchell, Neb.—Bonds, $6,000, have been voted to secure water for fire protection.

Corning, N. Y.—Quincy W. Wellington & Co. have purchased $100,000 water bonds for $100,026 and accrued interest.

Niagara Falls, N. Y.—Plans are being prepared for a water system to cost $400,000.—Willett W. Read, City Engineer.

Old Forge, N. Y.—Bids will soon be invited for constructing waterworks, $15,000 bonds having been voted for same.—Francis

K. Baxter, Arcade Block, Utica, Engineer.

Ashland, O.—The estimated cost to restore the Ashland waterworks plant will be $45,000.—A. P. Black, City Clerk.

Ashtabula, O.—The ordinance granting the waterworks franchise to the Ashtabula Water Company has passed Council; it includes recommendations for new pump, filtration plant, new hydrants, valves, etc.

Crooksville, O.—Engineer Morris states that he will have plans ready for Council in a few days for the proposed waterworks system for the village.

Oberlin, O.—Engineer Gerrish, of the waterworks plant, states that a large conduit must be built at Kipton; Council will recommend this undertaking.

Sandusky, O.—Council has adopted resolutions providing for advertising for bids and other preliminary steps towards the construction of a pumping station on Megs street; it will have a capacity of 6,000,000 gallons per day; plans are to be prepared and bids submitted by contractors; the plant will be modeled somewhat after the new Lorain plant.

Sayre, Okla.—Bonds, $25,000, have been voted for constructing waterworks system.

Eugene, Ore.—The city has voted for municipal ownership of the water system and elected an entire ticket favorable to the cause.—J. D. Matlock, Mayor-elec.

dinance granting the New Chestermlwyup

Chester, Pa.—Council will probably pass ordinance granting the New Chester Water Company the right to extend mains through the borough streets, and contract for the installation of at least twelve fire plugs, to cost borough $480 per year on 10-year contract.

Franklin, Pa.—Municipal ownership of the water plant is recommended; the matter is being considered by Council.—John P. Emery, Mayor.

McKeesport, Pa.—Bowman Bros. are the only bidders for the construction of the new $200,000 filtration plant; J. B. Ayres, Chairman of the Board of Public Service, states that the contract may not be awarded for two weeks.

Banberger, S. C.—An election will be held, May 7, to vote on the question of issuing $7,000 waterworks bonds.

Caldwell, Tex.—Council proposes to purchase additional pump and gasoline engine for water plant.

Nacogdoches, Tex.—Bonds, $50,000, have been voted for securing water supply.

St. George, Utah.—Arrangements are being made to install a complete water system, estimated to cost $21,000.

Norfolk, Va.—Bids will soon be invited for laying water main in Seventh Ward.—George W. Wright, Chief Engineer, Water Department.

Wheeling, W. Va.—Council proposes to issue $700,000 bonds for new pump, reservoir and filtration plant.

Bloomington, Wis.—A committee has been appointed to secure plans and specifications for a water system.

Wither, Wis.—Bonds, $7,000, have been voted for water supply.—M. Anderson, Clerk.

LIGHTING AND ELECTRICITY

Colorado Springs, Col.—Council has been authorized to issue $160,000 bonds for purchase or construction of municipal electric-lighting plant.—R. H. Ashworth, City Engineer.

Wilmington, Del.—The plans of Chief Engineer Leisen for utilizing the water power of the Cool Spring station for lighting purposes have been approved by the Water Commissioners.

Calhoun, Ga.—An election is to be held to vote bonds for an electric-light plant; plans, specifications and an estimate cost of plant are now being prepared.

Vienna, Ga.—The citizens have voted $10,000 bonds for electric-light plant and $5,000 bonds for sewerage purposes.

Peoria, Ill.—Supervisors are considering the matter of installing an electric-light plant at the County Farm.

Sheffield, Ill.—Franchise has been granted the Sheffield Electric Light Company to establish an electric-light plant.

Springfield, Ill.—A new electric company has been organized; the plans for the erection of a building are about completed and a conduit system covering some twenty square blocks in business section of the city has been platted and specifications for the installation of same have been prepared by James L. Adams, Jr., the engineer who has been engaged by the new company.

Roff, I. T.—Bonds, $10,000, have been voted for electric-light plant.

Herrington, Kan.—Bonds have been voted for a municipal electric-lighting plant.

Versailles, Ky.—The Versailles Electric Light Company, composed of Pennsylvania capitalists, represented by Edward Gunster, of Wilkes-Barre, Pa., has sold its electric-light plant here to Harry Reid, formerly of New York.

Brookline, Mass.—A committee of five has been appointed by the Brookline Board of Selectmen to consider the advisability of establishing a municipal light plant; Henry Howard, Philip S. Parker, John A. Conat and others are on committee.

Ashley, Mich.—William Kennedy & Son, of the Ashley Roller Mills Company, are arranging to put in an electric-light plant in the city.

Grand Rapids, Mich.—The Grand Rapids Muskegon Power Company has petitioned for a 27-year franchise to supply light and power to the people of Grand Rapids.

Holland, Mich.—The Board of Public Works will expend $30,000 enlarging the municipal electric-light plant.—A. E. McClellan, Chief Engineer.

Fergus Falls, Minn.—Council has adopted a comprehensive plan for improving the electrical system with a view to furnishing power, as well as light; the new concrete dam will be raised to a height of 29 feet, and the pond will extend back several miles, giving a considerable storage reservoir; bids will be called for in a few days for the construction of a new concrete dam; a new brick power house and a complete new outfit of electrical machinery; the cost is estimated at about $50,000; a new system of street lights is to be put in in conection with the other improvements.

Pass Christian, Miss.—Council proposes to establish a municipal lighting plant.—W. A. Terrill, Manager.

Newark, N. J.—Plans will be filed by the General Electric Company for the erection of a new factory employing 250 persons, at Eighteenth avenue and Lillie street; in time large additions are to be made to the building and the company proposes to establish one of the largest establishments in the city.

Syracuse, N. Y.—The Syracuse Light and Power Company has been incorporated with a capital stock of $1,000,000.—George E. Miller, of Philadelphia, Pa., President.

Beatrice, Neb.—A mortgage was filed in the office of the County Clerk by the Beatrice Gas and Power Company, to the Superior Savings and Trust Company, at Cleveland, O., amounting to $100,000; the contract provides that $40,000 of the total sum realized from the sale of the bonds shall be used for enlarging the plant in Beatrice.

Columbus, O.—The Board of Service has rejected all bids for additional machinery at the city lighting plant, and will readvertise for new bids.

Duncan Falls, O.—A light and power plant will be erected, at a cost of $50,000.—Address J. W. Wineforder.

Nelsonville, O.—John Lax, Clerk, states that the resolution to issue bonds for constructing levees and for repairing the lighting plant in the sum of $12,500, has passed Council.—John Lax, Clerk.

Goldthwaite, Tex.—Council has granted Gecslin & Co. an electric-light and power franchise, and they will at once install a plant, and conduct an ice plant in connection.

Hempstead, Tex.—A modern electric-light plant, to be installed and run under the ownership and management of a corporation, is proposed for this city; plans for the enterprise are yet in the elementary state.

Oklahoma City, Okla.—The Oklahoma Gas and Electric Company is planning extensions to its system of electric-lighting that will embrace all of the northern portion of the city, from Eighteenth street to Putnam Park.

Ontario, Ore.—The Idaho-Oregon Light and Power Company has been incorporated with a capital stock of $7,000,000 to generate and utilize electricity for light and motive power in Eastern Oregon and Idaho, and especially in Malheur County, and will establish Oregon headquarters at Ontario.

Spartansburg, S. C.—The Southern Power and Manufacturing Company, developing Broad river power, will erect a distributing plant, at a cost of $100,000, to be in operation within twelve months.—Address T. B. Lee, Charlotte, N. C.

Chattanooga, Tenn.—The Chattanooga Electric Company is preparing to make improvements, for which about $140,000 will be expended; new machinery will be installed, including 1,000-kilowatt generator, steam turbine, 500-kilowatt generator, four water-tube boilers of 410 horsepower, increasing present capacity of plant about 2,000 horsepower.—Byron T. Burt, General Manager.

Nashville, Tenn.—The Nashville Railway and Light Company has under consideration plans for various extensions.

Roanoke, Va.—The Roanoke Gas and Water Company proposes to install two new benches in gas house, and to lay about six miles of gas main.

Ballard, Wash.—Council has under consideration plans for establishing a municipal lighting plant.

Kenosha, Wis.—The towns of Bristol and Salem, this county, are planning the installation of a $40,000 electric-lighting plant to furnish electricity not only for the lighting of the streets of the two villages, but for the use in the homes of farmers in the towns; it is planned to have the plant in operation by September.—G. S. Higley, President.

Superior, Wis.—The city contemplates the erection of a municipal electric-light and power plant of about 1,000-horsepower capacity; plans and specifications will be completed about May 20.—Victor Linley, Mayor; Owen Ford, Security Building, St. Louis, Mo., Consulting and Supervising Engineer.

Calgary, Alta., Can.—The city will expend $35,000 for an extension to the electric-lighting plant.—F. W. Thorold, City Engineer.

FIRE EQUIPMENT

Fort Smith, Ark.—Arrangements are being made to improve the fire protection; new apparatus will be purchased.

New Haven, Conn.—Plans were announced by an officer of the Consolidated Railway Company, providing for a $200,000 improvement to the power house on Grand avenue, which includes the enlargement of the building and the installation of the new machinery and boilers.

Miami, Fla.—Arrangements are being made to build a fire hall; estimated cost of building, $5,000.

Lena, Ill.—The Fire Department building was destroyed; it contained steam fire engine, two hose carts, 2,000 feet hose, coats, boots and other fire-fighting apparatus; they must be replaced.

Springfield, Ill.—An electric railway from Terre Haute, Ind., to Quincy, Ill., and St. Louis, Mo., was licensed to incorporate by the Secretary of State; the road is the St. Louis, Terre Haute & Quincy Traction Company; the main offices are in Springfield; capital stock, $25,000; the road is to be constructed from a point in Illinois opposite Terre Haute to Venice and Quincy, Ill.

Linden, Ind.—G. N. Vancleave is promoter for a proposed electric line from this city to Attica.

Ft. Wayne, Ind.—The Toledo & Ft. Wayne Electric Railway Company has filed articles of incorporation, with a capital stock of $100,000; this is the interurban road to Bryan, O., through Maysville, Hall's Corners, Hicksville and Farmers' Center, and which will ultimately be built through to Toledo; the directors for the first year are John H. Zimmerman, Ira Grubb, Granville A. Reeder, and others; the company will also furnish electricity for lighting and power in the country it traverses.

St. Paul, Minn.—The Legislature has authorized the city to issue $100,000 bonds for building and equipment for Fire Department.

Albia, Ia.—Calvin Manning of Ottumwa, Ia., is interested in the construction of a street railway in this city; a franchise has been granted.

Des Moines, Ia.—Council has voted to build an engine house in Grand View near Danish College.

New Orleans, La.—The New Orleans Railway & Light Company has issued $5,000,000 bonds; extensive improvements will be made in the system.

Eveleth, Minn.—The franchise granting the Messaba Traction Company right to construct an electric line is being considered by Council.

Jackson, Miss.—Council has passed an ordinance issuing $50,000 bonds for City Hall and additional fire engine house.

Jersey City, N. J.—The appropriation of $17,000 for fire escapes on school buildings is being considered by the Board of Finance.—Fred Dieffenbach, Director of Education.

Alberquerque, N. M.—A. G. Gurtleff has petitioned for engine, hook and ladder truck and combination wagon for the Fire Department.

Sherburne, N. Y.—The Whitmore Hose Company is preparing to purchase new uniforms.

East Liverpool, O.—Arrangements are being made to build City Hall and engine house, at a cost of $12,000; it is proposed to purchase fire apparatus also.

Erie, Pa.—The question of improved fire protection is under consideration.—Chairman Stephen D. Hogan.

Pittsburg, Pa.—Fort Pitt Light, Heat & Power Company, Turtle Creek, has been incorporated, with a capital stock of $10,000, by B. S. Hare, M. R. Chulbuck, E. L. Vandermast, and others, all of Pittsburg.

Ridley Park, Pa.—Council is arranging to purchase additional fire hose.

Dalhart, Tex.—Council has authorized an issue of $8,000 bonds for the erection of a City Hall and for fire protection.

Aberdeen, Wash.—Council proposes to improve fire protection.

Pasco, Wash.—Council is arranging to purchase fire apparatus; a fire company will be organized soon.

Phoenix, B. C.—Arrangements are being made to improve fire system.—M. M. Stephens, Fire Chief.

PUBLIC BUILDINGS

Birmingham, Ala.—The citizens of Jefferson County have voted $135,000 bonds for the erection of a Court House.—Robert A. Morris, County Auditor.

San Rafael, Cal.—Many improvements will be made by the new Board of City Trustees just installed, including a new City Hall, for which bonds were voted last year.—Matt J. Pedroth, President of Board.

Wilmington, Del.—The School Board has been authorized to issue $16,000 bonds for school purposes.

Owensboro, Ky.—The Owensboro & Rockport Bridge & Terminal Company, recently incorporated, plans to build bridges across the Ohio river, and to construct ten miles of track and terminals, costing about $2,000,000.—A. H. Kennedy, of Rockport, Ind., President.

Paducah, Ky.—The Illinois Central in connection with terminal improvements will erect trestlework at an estimated cost of $25,000.

Homer, Ill.—An election will be held to decide the question of issuing bonds for the erection of a school house.

Moville, Ia.—The citizens have voted $8,000 bonds for school purposes.

Midland, Mich.—The citizens of Midland County have voted to issue $65,000 Court House bonds.

Akeley, Minn.—The citizens have voted $18,000 in bonds for school purposes.

Austin, Minn.—The citizens have voted $30,000 4 per cent. school bonds.

Magnolia, Miss.—Bids will be received May 15 for the purchase of $25,000 5 per cent. 20-year school bonds.—A. L. Lazar, Town Clerk.

Joplin, Mo.—The School Board will offer for sale $50,000 additional 4 per cent. 20-year school bonds.

Amherst, O.—Bonds have been voted for erecting a school house.

Columbus Grove, O.—An election will be held May 3 to decide the question of issuing $12,000 in bonds to construct city building.

East Liverpool, O.—Arrangements are being made to issue $12,000 bonds for the erection of City Hall and Fire Department building.

Adel, Okla.—Arrangements are being made to issue bonds for erecting system of county schools.

Astoria, Ore.—Bonds to the amount of $20,000 have been voted for a school house.

Hollidaysburg, Pa.—Arrangements are being made to issue $20,000 bonds for school purposes.

Delhart, Tex.—Bonds have been voted for a City Hall and fire station, to cost $8,000.

Salt Lake, Utah.—The School Board of the Granite District has decided to issue $40,000 bonds to pay for school house.

St. Johns, Wash.—Bonds to the amount of $16,000 have been voted for school purposes.

STREET RAILWAYS

Bridgeport, Ala.—Council has granted a franchise for an electric railroad to T. W. Pratt of Huntsville, Ala., who is connected with the proposed Huntsville & Nashville Railway.

Atlanta, Ga.—The Georgia Railway Company will build an extension from East Point, on the College Park line, through Hapeville, three miles long.

Carthage, Ill.—An interurban trolley line is to be built from Carthage to Ft. Madison, Ia., via Nauvon and Neota, Ill.; work will begin at Carthage June 1; the Carthage Electric Light and Power Company will supply the power.

Champaign, Ill.—The Chicago, Ottawa & Peoria Railway Company has been incorporated, with a capital stock of $50,000, for the purpose of constructing a line from Chicago to Peoria and from Ottawa to Princeton.—H. E. Chubuck of Ottawa; C. A. Wright, and others, Incorporators.

Petersburg, Ind.—The Vincennes, West Baden & Western Railroad Company has filed mortgage with the Chicago Trust & Savings Bank, for the purpose of issuing $1,250,000 bonds for building and equipping road from Vincennes to West Baden.

Tulsa, I. T.—A territorial charter has been granted the Kansas City, Tulsa and Southwestern Railroad, capital $5,000,000, which will build a 600-mile road from Joplin, Mo., to the Gulf of Mexico; provision is made for a branch line from Shawnee, Okla,. to Oklahoma City.—Jay Forsythe, C. D. Lynch, W. A. Cooke, and others, all of Tulsa, Incorporators.

Girard, Kan.—The Board of County Commissioners has granted a franchise to the Girard Coal Belt Electric Company to build an electric line along the county highways for a trolley system through Dunkirk to Mulberry.

Louisville, Ky.—The stockholders of the Louisville Traction Company have voted to increase the capital stock $3.000,000; the company anticipates making extensions on the Pardstown road from Doup's Point to Stringtown, a distance of eight miles, to cost between $15,000 and $20,000 a mile to build and equip; the company may also decide to go further when the line is finished to Stringtown.

Boston, Mass.—The Boston Electric Railway Company proposes to issue $5,800,000 of bonds and $8,000,000 of stock for the purpose of floating indebtedness and for improvements and construction purposes.

Troy, N. Y.—There were no bidders recently for franchise for constructing and operating a street railway on Congress street from Brunswick avenue to the eastern city line; the services of the United Traction Company are to be enlisted in the scheme.—Address Mayor Mann.

Oklahoma City, Okla.—The Oklahoma City Street Railway Company has decided to expend $500,000 for betterments and improvements, including extensions of lines.—John W. Shartel, General Manager.

Pittsburg, Pa.—The Mentor Street Railway Company has been incorporated for the purpose of building a line in Elizabeth borough, the townships of Forward and Elizabeth, in Allegheny county.—D. R. Neagley, Pittsburg, President.

Nashville, Tenn.—The proposed electric railway to the proposed site of the White City will be built by S. P. Kondon, of Knoxville, Tenn.; Chas. Kuhn of Buena Vista Springs is promoter of the plan; lines will be about two miles long and estimated to cost $125,000.

Galveston, Tex. — The Austin-Galveston Electric Company has been incorporated for the purpose of building an electric interurban line; preparations are being made to commence the construction at once.

Elkins, W. Va.—The Elkins Electric Railway Company has secured franchise to use city streets for street railway.

BRIDGES

Galt, Cal.—Bridge builders are at work putting in a temporary bridge across Dry creek, immediately south of Galt, to replace the structure that went out in the flood a few weeks ago; in the early fall months it is proposed to erect a substantial steel and iron combination bridge where the temporary work is now being done.

Tampa, Fla.—The Seaboard Air Line is arranging to erect an iron bridge at Tampa, to cost $95,000.

Hutsonville, Ill.—The Highway Commissioners of Hutsonville and Lamotte townships met a representative of the Big Four and arrangements have been made whereby the company will build an overhead wagon bridge across its tracks on the township line at the grade south of town; the bridge will be 90 feet in length, with concrete abutments, and will have an approach of 100 feet on either side.

Rockport, Ind.—Several new bridges will be built in Spencer county.

Hutchinson, Kan.—Council has under consideration the construction of a bridge at Avenue F, East.

Topeka, Kan.—Shawnee and Jefferson counties propose to build bridge across the Kaw river.

Le Roy, N. Y.—An election will be held, May 7, to decide the question of issuing $20,000 bonds to build a bridge across the Oatka river.

Abbeville, La.—As the result of a conference between a special committee appointed by the Police Jury of Vermillion Parish and a like committe from Arcadia Parish, a new bridge will shortly be constructed over Bayou Queen de Tortue, about four miles west of the town of Gueydan; the proposed bridge will cost about $5,000, of which amount the police jury of Vermillion Parish has appropriated the sum of $2,500.

Haverhill, Mass.—The expenditure of about $1,000 for painting and repairing Haverhill bridge is being considered by Council.—Robert R. Evans, City Engineer.

Duluth, Minn. — Harbor improvements planned for this year include the reconstruction of the Northern Pacific bridge over the St. Louis bay and a readjustment of part of the Northern Pacific approach tracks and terminals at a cost of nearly $1,000,000 and the dredging of part of the harbor channels by the government.

Carthage, Mo.—The people in the eastern part of the county want three bridges across Grand river, and they are making an effort to get before the Court, one to be east of Hale, one east of Bosworth and one near Brumswick.

Leroy, N. Y.—Bonds, $17,000, have been voted for bridge purposes.

Reno, Nev.—Bonds, $24,000, have been authorized to build bridge at Scott street.

Akron, O.—The County Commissioners have ordered plans and specifications prepared for the construction of a concrete and iron bridge at Young's Crossing.

Cincinnati, O.—The City Engineer recommends an issue of $75,000 bonds to build retaining walls.—M. J. Keefe, Clerk, Board of Public Service.

Hamilton, O.—The County Commissioners have received plans for the new bridge to span the canal and C. H. & D. R. R. at Woodsdale from Engineer D. A. Dillon; the structure, with a wood flooring, will cost $15,000, with permanent flooring $18,000; bids will be advertised for in a few days.

Toledo, O.—The City Auditor has been directed to advertise for bids for the purchase of $525,000 Cherry street bridge bonds.

Eugene, Ore.—The court of Lane county has decided to build a bridge across the McKenzie river at Hendricks Ferry, in Lane county; sealed bids will be received.—E. U. Lee, County Clerk.

Portland, Ore.—Council has decided to build a reinforced concrete bridge at East Twenty-eighth street.

Doylestown, Pa.—The taxpayers have petitioned for a bridge near Tradesville; the County Commissioners have under consideration plans for a reinforced concrete arch bridge in Perkasie borough.

Pittsburg, Pa.—A proposition to widen the Smithfield street bridge 4½ feet is being considered by the Pittsburg Railways Company, and engineers are working on the improvement which, it is estimated, will cost $100,000; the plan is to widen the eastern side of the bridge so all cars can be run over it, leaving the western driveway free to vehicle traffic.

Washington, Pa.—The County Commissioners are busy going over the bridge docket to decide what bridges will be built.

Williamsport, Pa.—The viewers of Lycoming County recommend building a $65,000 bridge between Jersey Shore and Antes Fort.

Ogden, Utah.—The County Board has prepared to construct a concrete bridge over the Ogden river.

North Yakima, Mich.—As a means of doing away with the dangerous grade crossing over the Northern Pacific tracks on Yakima avenue, the main thoroughfare which connects the two sides of the town, Engineer W. B. Chase, the expert who has been retained to advise the city in its paving project, will probably recommend that a viaduct be built across the tracks to carry the travel safely across the railroad.

Morgantown, W. Va.—The question of issuing $75,000 bridge bonds will be submitted to voters June 1.—John M. Gregg, Clerk.

Jamesville, Wis.—The City Engineer has been directed to prepare plans and estimates for bridge across the Spring brook.

MISCELLANEOUS

Centerville, Ala.—New officers elected are committed to proposition to light the streets and improve sidewalks.—Dr. S. C. Meigs, Mayor.

Haverhill, Mass.—Council is considering the purchase of a new road machine and four hokey pokey carts desired by Superintendent of Streets Westcott.—Roswell L. Wood, Mayor.

Bay City, Mich.—The proposition to issue $200,000 bonds for public park carried.

Jackson, Mich.—Council has passed an ordinance providing for an issue of $50,000 bonds for repairing City Hall building and for additional engine houses.

Cortland, N. Y. — Superintendent Becker has been authorized to purchase a street sprinkler, at a cost of $330.

New York, N. Y.—No bids for the new subways were received at the time appointed by the Rapid Transit Commission for receiving bids for the proposed subways on Seventh, Eighth and Lexington avenues. It is suposed that the terms imposed in the contract by the Commission, together with the provisions of the Elsberg bill, made the proposition unattractive to private capital.

BIDS RECEIVED

Pasadena, Cal. — Contracts have been awarded as follows: Improving Stevenson avenue, to J. E. Haddock, at the price specified in proposal on file for said work, to wit, sidewalk, per square foot, 10 cents; grading, per lineal foot, 58 cents; curb, per lineal foot, 23 cents; gutter, per square foot, 12½ cents; oiling, per lineal foot, 50 cents; Summit place, to McD.-Lee Co., cement sidewalk, per square foot, 10 cents; grading and oiling, per lineal foot, $1.35; curb, per lineal foot, 25 cents; gutter, per square foot, 13½ cents; laying 8-inch vitrified sewer in Lincoln avenue, with appurtenances, at 90 cents. per lineal foot.—Herman Dyer, City Clerk.

New Haven, Conn.—Thomas F. Maher has been awarded contract to construct four sewers, as follows: Hurlburt street, $555; Archer street, $1,064.80; Gibbs street, $495.50; Pierpont street, $1,255, and Duryea & Minnex, sewers in West street for $1,013 and in Goffe street, $6,591.50.

Waterbury, Conn.—The American Car Sprinkling Company of Worcester, Mass., has been awarded contract to sprinkle the streets, on a basis of 10 cents per lineal foot for six days work, adding one-tenth of

a cent for seven days, and sprinkling the boulevard on Sunday free; the city will spend $3,000 for sprinkling the streets the balance of the season, with the privilege of renewing the contract for four years more at a reduction of 5 per cent.

Polo, Ill.—The contract for installing sewer system has been awarded to Stoltz & Gass, Belleville; cost, $37,000.

Indianapolis, Ind.—The Board of Public Works has awarded the contract for the construction of the Pleasant Run sewer to Morris M. Defrees, of this city, at $5.73 per foot; the Parmley system of reinforced concrete blocks will be used; the total cost will be about $120,000.

Lagrange, Ind.—A contract for the paving of Detroit street in this city has been awarded to the Moellering Construction Company of Fort Wayne; consideration, $13,280.75.

Terre Haute, Ind.—The contract for the construction of the Ohio street sewer has been awarded to William J. Erler, 319 Swan street, for $7,260.

Boston, Mass.—The two lowest bidders for paving Bennington and Prescott streets, Boston, were Coleman Brothers at $12,646, and Jones & Meehan at $12,098.

Louisville, Ky.—L. R. Figg has been awarded contract to lay 13,260 square yards vtirified brick, on 6-inch 1:2:4 concrete base at $1.72-$1.78 per square yard; excavation 8,620 cubic yards clay-gravel at 45-60 cents; also furnishing and setting 6,910 lineal feet new curb at 85-88 cents. G. W. Goswell has contract for 9,480 square yards vitrified block on 1:2:4 concrete base, at $1.75-$1.80; 8,260 cubic yards clay-gravel excavation at 56-57 cents; also 5,350 lineal feet new curb at 85-90 cents.—D. R. Lyman, First Assistant Engineer.

Wyandotte, Mich.—The J. E. Conley Company, Dayton, O., has been awarded contract to extend paving on Biddle avenue, about 18,000 square yards, with Metropolitan block, at $1.83 per square yard, and Berea curbing at 58 cents per lineal foot, also excavating at 40 cents per cubic yard.

Wilmont, Minn.—W. D. Lovell of Minneapolis, Minn., has been awarded the contract for constructing a waterworks system here, to cost $6,740.—Address J. J. Weitzel for information. Mentioned March 16.

Lucayston, Mont.—W. S. Gray & Co., Minneapolis, Minn., have been awarded contract to construct 1,400 feet 10-inch sewer pipe in 17-foot trench, at $2.20 per lineal foot; 2,500 feet 12-inch, in 10-foot trench, $1.85; 1,300 feet 15-foot, 10-foot trench, $2.50; 2,750 feet 18-inch pipe, 5-foot trench, water to handle, at $2.30; 20 6-foot concrete manholes, $40 each; manholes per foot over 6-foot, $6; flushtank, including all fittings, $100; concrete outlet bulkhead, $9 per cubic yard; flushtank connection, ¾-inch galvanized pipe, laid 5 feet deep, 35 cents per foot; total, $18,845.50; other bids were: R. M. Bardsen & Co., Butte, $20,399.50; James Kennedy, Fargo, N. D., $20,973.50; Nordstrum & Co., Butte, $26,168.50; G. N. Haggart, Fargo, N. D., $23,142; Alstrap & Olson, Minneapolis, Minn., $22,235.—C. T. Sacket, City Engineer.

New York, N. Y.—Fuller & O'Connor, 26 Court street, Brooklyn, have been awarded the contract, at $302,000, for remodeling the Ridgewood pumping station, north side of Atlantic avenue, between Logan and Chestnut streets.

Columbus, O.—The Hudson Engineering & Contracting Company, of New York, has the contract to put in an artesian water system for this town, at a cost of $85,000.

Ravenna, O.—R. E. Morgan of Ravenna was successful bidder for building road in Portage county, at $12,784; approximate estimate, 5,863 cubic yards excavation, 4,708 cubic yards fill, 1,155 cubic yards waste, 4,311 cubic yards macadam, loose stone, 150 lineal feet 12-inch vitrified sewer pipe, 24 lineal feet 24-inch cast iron pipe, head walls and repairs.

Hillsboro, O.—In the Highland county letting April 19 the successful bidder was P. S. Covon, Sinking Springs, at $5,571; approximate estimate: 2,921 cubic yards excavation, 2,558 cubic yards fill, 363 cubic yards borrow, 3,733 cubic yards macadam loose stone, 36 lineal feet 10-inch cast iron pipe, 48 lineal feet 12-inch cast iron pipe.

Zanesville, O.—The firm of Evans and Harper has been awarded contract at Mt. Vernon for $33,000 worth of paving on a number of streets.

Troy, N. Y.—The Bermuda Asphalt Company has been awarded contract to furnish 25 tons of asphalt for use in repairing streets at $27.50 per ton; John H. Gleason bid $33.50 and the Warren Asphalt Company $35; bids for constructing a 12-inch pipe sewer in Eighth street were received as follows: Frank Bosch, $1,406; P. S. Cavanaugh, $1,251.44; John Warwick, $1,199.38; John Flynn, Jr., $1,642.

Springfield, O.—Hugh Russell has contract for street work in District No. 1, M. C. Russell in District No. 2, Acme Cement Company District No. 3, and Robbins & McDaniels District No. 4.

Scranton, Pa.—James Manley was awarded contract to construct 6,960 feet 6, 10, 12, 15 and 20-inch terra cotta pipe in 11½-foot trench, the excavation being largely of stone, at $2.50 per foot, including everything necessary for the full completion of the work—manholes, basins, house and basin connections; he refused to accept contract; Salvator De Martino bid $2.98, Fred J. Egli, $3.05, Dale & Gaynor, $3.12½, M. A. Donohue, $3.18, and Climax Construction Company, $3.45.—Henry Jifkins, Chief Engineer.

SPECIALISTS—We offer the surest means of finding your right place if you are a specialist in any high grade technical line; write to-day, stating experience. Hapgoods, 305 Broadway, New York.

MUNICIPAL CIVIL SERVICE COMMISSION
299 Broadway.
New York, March 13, 1907.

Public Notice is Hereby Given that applications will be received from Wednesday, March 13, until 4 P.M. Monday, May 13, 1907, for the position of

TOPOGRAPHICAL DRAUGHTSMAN.

The examination will be held on Wednesday, May 29, 1907, at 10 A.M. The examination is open to all citizens of the United States. Vacancies exist in the Board of Water Supply. Certification will be made for appointment at $1,200 per annum only.

For scope of examination and further information, apply to the Secretary.

FRANK A. SPENCER, Secretary.

STREET LAMP ATTACHMENT

The present flat flame gas light quickly changed to BEST MODERN LIGHTS.

Lamps giving 10-25 candlepower made to produce 40 to 70 candlepower. No additional gas consumed

CENTURY LIGHT & POWER CO.
35 Warren St., N. Y. City

Proposals

REMOVING STONE CRUSHER PLANT

Burlington, Iowa.

Bids will be received at the office of the City Clerk, until 4 o'clock p. m. Monday, May 20, 1907, and opened at the first regular or adjourned Council meeting thereafter, for the sale and removal of the City Stone Crusher Plant. This includes one No. 4 Bates crusher, capacity 150 yards per ten hours, one Murray Iron Works 25-horsepower engine and one 40-horsepower Murray Iron Woks boiler, three stone cars, cables, belting and 1,000 feet of rail, revolving screen and bins, and buildings complete.

The city reserves the right to reject any and all bids or to accept the proposal deemed by them to be for the best interests of the city. For further information inquire of City Engineer or the Improvement Committee.

WM. E. ROCHE,
Chairman Internal Imp't Com.
J. F. WINTERS,
City Engineer.

SEWERS

Sandersville, Ga.

Sealed proposals will be received at the Council Chamber at Sandersville, Ga., until 3 p. m., May 3, for furnishing all materials and constructing complete, about six miles of 8-inch to 15-inch sewers, with manholes, flushtanks, etc.

For information and specifications, address the Consulting Engineer. Plans and profiles may be seen in Atlanta.

D. L. CHEATHAM, Mayor,
Sandersville, Ga.
ARTHUR PEW, Cons. Engr.
619-20 Temple Court, Atlanta, Ga.

PRELIMINARY FILTERS

Albany, N. Y.

Sealed proposals will be received by the Board of Contract and Supply, at its office in the City of Albany, N. Y., until 3 p. m., Monday, May 6, 1907, for the construction of preliminary filters.

The work consists of the construction of sixteen reinforced concrete filter tanks, each 54 feet long by 18 feet wide, with operating gallery, pumping station and appurtenances, according to plans and specifications prepared by the Bureau of Water.

Drawings may be seen, and notice to contractors, forms of proposal, specifications, contract and bond obtained at the office of the Board of Contract and Supply or at the Bureau of Water, No. 25 Quockenbush street, Albany, N. Y.

ISIDORE WACHSMAN,
Clerk of the Board.
WALLACE GREENALCH,
Engineer and Supt., Bureau of Water.

USING KENTUCKY ROCK ASPHALT IN PLACE OF SCREENINGS FOR MACADAMIZED ROADS

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The Coming Roadway

Write for Descriptive Booklet

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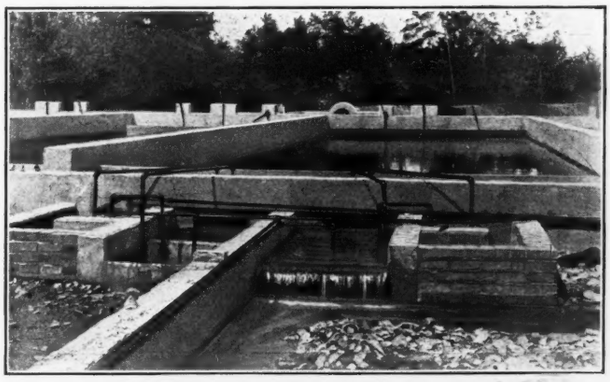
Trade Notes

SEWAGE DISPOSAL APPARATUS.—The Merritt automatic air lock sluiceways, manufactured by Merritt & Company, 1024-1028 Ridge avenue, Philadelphia, Pa., are used for the operation and control of sewage purification works in lieu of mechanical valves. The accompanying illustration of the city sewage purification works of Charlotte, N. C., shows the inlets to the contact beds and operating chambers. The rise and fall of liquid in the filter beds is solely relied upon for opening and closing the inlets and outlets to and from the filters and for regulating the time during which sewage is held up in contact beds. Hence contact beds of any design may be operated by these sluiceways, irrespective of the fall to and from the filters. This is accounted for by the fact that the passageways are so formed that they will remain closed against a head greater than that required for injecting the necessary volume of air. The Merritt sluiceways, differing from siphons, remain open until positively closed and thus avoid the choking of under-drains with accumulations of the "after-drip." The State Engineer of New Jersey, in describing a plant at Essex Falls, N. J., equipped with the Merritt apparatus, described its operation in these words: "The water in the contact filters rose at a rate which indicated that, in spite of almost constant use for eighteen months, the voids amounted to nearly 40 per cent. of the mass. One bed filled in a little more than six hours. When nearly full the outlet to the second bed opened automatically and both pipes ran full for ten minutes. Then the flow to the full bed ceased and the whole stream went to the second bed. The outlet of the first bed remained locked, and the sewage lay undisturbed, for forty-six minutes. Then the 'timing chamber' automatically unlocked the outlet, and the flow to the lower gravel bed began."



MERRITT AUTOMATIC AIR LOCK SLUICEWAYS

REMOVAL NOTICE.—The Northampton Portland Cement Company has removed its sales office from No. 1 Madison avenue, New York City, to Stockertown, Pa., where the general office and mill is located.

METERS.—The Neptune Meter Company announces that, owing to the increase of business, it has been compelled to seek larger quarters and is now locating on the tenth floor of the new West Street Building, 90 West street, New York City.

COAL HANDLING.—The C. W. Hunt Company, 45 Broadway, New York City, publishes a catalogue, No. 072, for the use of engineers and architects, which contains, besides descriptions of machinery, necessary information for installing it. The machinery made by this company is suitable for use in ordinary city power stations, especially if they are located on the water front, as well as for coal yards, shipping docks and the like.

PERSONALS

JOHNSON, WILLIAM S., for the past twelve years Assistant Engineer of the State Board of Health of Massachusetts, announces that he has opened an office at 101 Tremont street, Boston, for the practice of civil engineering.

LEDOUX, J. W., has been selected by Engineers Boardman and Witham as the third expert to investigate the water system of Camden, N. J.

MCCALLY, W. A., of Tuscaloosa, Ala., has been engaged as City Engineer of Decatur, Ala., and will at once make a survey and estimates for paving over 57,000 feet of street pavements, which have been authorized by the City Council.

MEYER, EDWARD, Paul Rheindorff and Otto Stockhausen, engineers retained by the city of Hamburg, Germany, are visiting New York City, having been sent to this country to study tunnels and their construction; it is the intention of the German city to build a tunnel by compressed air under the Elbe, 90 feet below water level and 1,500 feet in length, partly through solid rock and quicksand.

MONAHAN, FRANK, Inspector of Police of Jersey City, N. J., who last December made the raid on gamblers by direction of Mayor Mark M. Fagan, which resulted in the retirement of Chief of Police Murphy and a number of other police officials, has been appointed head of the force, relieving Acting Chief James F. Rooney; he has been a member of the Department nineteen years.

MUIR, DR. E. S., has been elected Mayor of Winona, Minn., defeating J. T. Libera.

POTTS, J. HERBERT, Fire Commissioner of Jersey City, N. J., died recently of cancer of the throat.

POTTER, ALEXANDER, and T. Chalkley Hatton have been retained by the Borough of St. Mary's, Pa., as Consulting Engineers in connection with the design and construction of a sewerage system and sewage disposal plant, money having been voted by the people.

QUIGLEY, JOHN P., Chief Engineer of the Fire Department of Syracuse, N. Y., was, on the tenth anniversary of his service as head of the service, presented by Mayor Alan C. Fobes with a $350 diamond badge on behalf of the men under his command.

REYBURN, JOHN E., Mayor of Philadelphia, Pa., succeeding John Weaver, has announced the following appointments: Director of the Department of Public Works, George B. Stearns, Architect and Engineer; Director of the Department of Public Safety, Henry Clay; Director of the Department of Health and Charities, Dr. Joseph S. Neff; Director of the Department of Supplies, Joseph H. Klemmer.

ROBERTS, WILLIAM JOHN, Mayor of Ishpeming, Mich., has been reelected and Frank P. Sullivan has been chosen as Chief Executive of Sault Ste Marie.

SLAUGHTER, L. C., has been reelected Chief of the Fire Department of Ardmore, I. T.; Buck Garrett, Assistant Chief; Bert Parker, Foreman; D. F. Sewell, Secretary.

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Besides, we have millions of feet of lumber in our yards fully air-dried, and millions more at our command. Hubs and rims in ample quantities to meet the most extensive demand and a big line of the unbreakable spokes which have helped t make the fame of the

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However, the demand may again double and the only absolutely sure thing is that the man who orders now will have his order filled at once.

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